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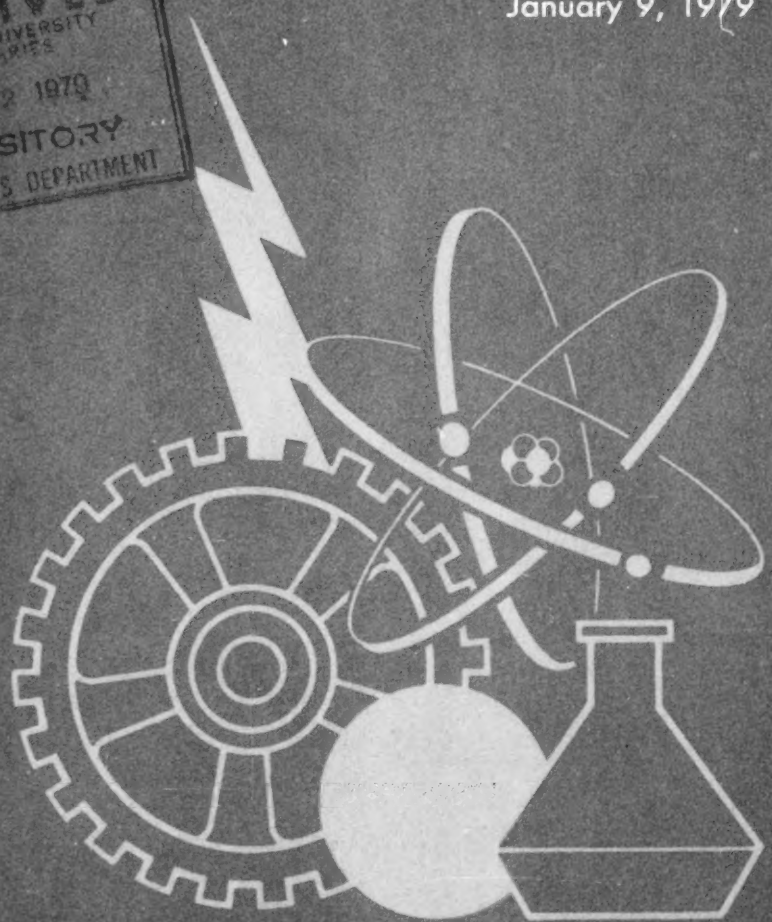

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OFFICIAL GAZETTE of the
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January 9, 1979 Volume 978 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) : Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of October 3, 1978.

DONALD W. BANNER.

Nov. 7, 1978. *Commissioner of Patents and Trademarks.*

National Inventors Day

The Patent and Trademark Office, along with the National Council of Patent Law Associations, will co-sponsor National Inventors Day in the Public Search Room on Saturday, February 10, from 1 :00 p.m. to 5 :00 p.m. and Sunday, February 11, 1979 from 10 :30 a.m. to 5 :00 p.m. The public is invited to view the exhibits on these days and to attend the dedication of the National Inventors Hall of Fame and the induction of four inventors into the Hall of Fame at 1 :00 p.m. on Sunday, February 11.

In order to accommodate the exhibits, it will be necessary to close the Public Search Room at 5 :00 p.m. on Friday, February 9, 1979.

We would appreciate the cooperation of all users of the Search Room facilities by removing all personal properties and items for the early closing.

LUTRELLE F. PARKER,
For DONALD W. BANNER,

Dec. 7, 1978. *Commissioner of Patents and Trademarks.*

Flexible Working Hours

On January 4, 1979 the Patent and Trademark Office is beginning a 15 month experiment with flexible working hours for its employees. Under the "flexitime" experiment many of the Office's employees will have flexibility to begin their workdays as early as 6 :30 a.m. or as late as 9 :30 a.m., and end their workdays between 3 :00 p.m. and 6 :00 p.m. Employees in every case shall of course work eight hours each day. All or most patent and trademark examiners will have flexible hours.

The public hours of the Patent and Trademark Office will continue to be 8 :30 a.m. to 5 :00 p.m. All units of the Office which deal directly with the public will be staffed to answer telephone calls and receive visitors during those hours. All employees will be on duty from 9 :30 a.m. to 3 :00 p.m. The patent public search room will continue to operate from 8 :00 a.m. until 8 :00 p.m. and the trademark search room from 8 :00 a.m. until 5 :30 p.m.

With the advent of flexible hours, it will be advisable for members of the public to make appointments in advance when they wish to interview examiners.

DONALD W. BANNER,

Dec. 13, 1978. *Commissioner of Patents and Trademarks.*

Patent Suits

Notices under 35 U.S.C. 290 : Patent Act of 1952

2,951,208, L. E. Barton, TEMPERATURE CONTROLLED SEMI-CONDUCTOR BIAS CIRCUIT **filed** Nov. 3, 1977, United States Court of Claims (Washington, D.C.), Doc. 536–77, *RCA Corporation* v. *The United States of America.*

2,991,225, A. F. Harms, O-METHYLBENZHYDRYL-DIMETHYLAMINOETHYL ETHYL PROCESS AND COMPOSITION FOR SYMPTOMATIC RELIEF OF THE SYNDROME OF PARKINSONISM AND OF SPASTIC SKELETAL MUSCLE DISORDERS, **filed** Mar. 28, 1978, D.C. (District of Columbia), Doc. 78–0553, *Riker Laboratories, Inc.* v. *Gist-Brocades N.V.*

3,029,581, H. C. Robbins, DESICCATING APPARATUS, **filed** Oct. 11, 1978, D.C., C.D. Calif. (Los Angeles), Doc. 78–3874–LTL, *Robbins Aviation, Inc.* v. *American Bristol Industries, Inc.*

3,043,506, F. C. Bremer, ENVELOPE CONSTRUCTION; **3,588,456,** R. P. McNabb, DOCUMENT CARRIER ENVELOPE, **filed** Apr. 25, 1978, D.C. Nebr. (Omaha), Doc. CV78–9–176, *Fred C. Bremer et al.* v. *Riley Advertising Company.* **Same, filed** Mar. 23, 1978, D.C., N.D. Tex. (Dallas), Doc. CA–3–78–0338C, *Check Savers, Inc.* v. *Western States Envelope Company, Inc.*

3,056,836, Moed and Van Houtenlaan, ARALKYLAMINES AND METHODS OF PREPARATION THEREOF, **filed** Sept. 13, 1978, D.C.N.J. (Trenton), Doc. C–782246, *Mead Johnson & Company and U.S. Philips Corporation* v. *West-Ward, Inc.*

3,096,622, R. E. Landau, SOIL SETTLING METHOD, **filed** Sept. 13, 1978, D.C., S.D. Ill. (Springfield), Doc. 78–3165, *Richard E. Landau* v. *J. D. Barter Construction Co., Inc. et al.*

3,164,255, R. S. Jay, MODULAR CANTILEVER ARM RACK; **3,476,260,** same, STORAGE RACK FOR CYLINDRICAL CONTAINERS; **3,512,654,** Olsen and Jay, MODULAR CANTILEVER ADJUSTABLE ARM RACK AND JOINT ASSEMBLY, **filed** Nov. 4, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77–4139–RMT, *Jarke Corporation* v. *Storage Rack Systems, Inc. et al.*

3,165,045, J. H. Troll, DATA PROCESSING SYSTEM, **filed** Dec. 2, 1977, D.C. Mass. (Boston), Doc. 77–3669–T, *Itek Corporation* v. *Information International, Inc.*

3,192,198, Nayler and Smith, PENICILLINS; **Re. 28,744,** Long and Nayler, CRYSTALLINE P-HYDROXYAMPICILLIN AND SALTS THEREOF, **filed** Oct. 3, 1978, D.C. Del. (Wilmington), Doc. 78–407. *Beecham Group Limited* v. *American Home Products Corporation.* **Same, filed** June 12, 1978, D.C. Del. (Wilmington), Doc. 78–324, *Beecham Group Limited* v. *Warner-Lambert Company.* **Same, filed** June 12, 1978, D.C. Del. (Wilmington), Doc. 78–235, *Beecham Group Limited* v. *Squibb Corp.* **Same, filed** Nov. 28, 1977, D.C. (District of Columbia), Doc. 77–2021, *Biocraft Laboratories, Inc.* v. *Beecham Group Limited et al.*

3,231,512, R. W. Harter, ADSORPTION DEVICE; **3,313,630,** W. T. Harvey, PROCESS AND APPARATUS FOR PRESERVING ANIMAL AND PLANT MATTER; **3,313,631,** W. P. Jensen, APPARATUS FOR PRESERVING ANIMAL AND PLANT MATTER; **3,451,782,** W. P. Jensen, CATALYTIC REACTOR, **filed** July 26, 1977, D.C., E.D. Wash. (Spokane), Doc. C–77–214, *Food Storage Systems, Inc.* v. *Crowder Refrigeration, Inc. et al.*

3,241,876, W. S. Saunders, APPARATUS FOR REDUCING LINEAR AND LATERAL WIND RESISTANCE IN A TRACTOR-TRAILER COMBINATION VEHICLE; **3,309,131,** same, MEANS FOR REDUCING LINEAR WIND RESISTANCE IN SINGLE CHASSIS TYPE VEHICLES, **filed** Apr. 8, 1974, D.C., N.D. Ind. (South Bend), Doc. 74–83, *W. Shelden Saunders and Rudkin-Wiley Corporation* v. *Air-Flo Company et al.* Pursuant to order of court judgment entered for defendants and against plaintiffs, Aug. 10, 1977.

3,260,340, Locklar and Sims, REVISION SYSTEM FOR DATA RECORDING AND PRINTING APPARATUS; **3,297,124,** D. E. Sims, DATA RECORDING AND PRINTING APPARATUS CAPABLE OF RESPONDING TO CHANGED FORMAT; **3,490,004,** R. F. Ross, DATA PROCESSING AND PRINTING APPARATUS; **3,512,137,** Jones and Kolpek and Rahenkamp, CORRELATED RECORDING, REPRODUCING, PRINTING, AND COMPOSING APPARATUS; **3,630,336,** Johnson and McCray, PROPORTIONAL SPACING PRINTER INCORPORATING CORD UNDERSCORE CONTROL; **3,764,994,** Brooks and Lewis, SERIAL PRINTER WITH BIDIRECTIONAL DRIVE CONTROL; **3,991,405,** Boyd and Toups, MARGIN ADJUSTING OF TEXTUAL CODES IN A MEMORY, **filed** Feb. 23, 1978, D.C., N.D. Tex. (Dallas), Doc. CA3–78–0210–C, *International Business Machines Corporation* v. *Xerox Corporation.* Based on joint motion to dismiss, this cause dismissed with prejudice, Aug. 1, 1978.

3,274,863, K. Faber, CHIP CUTTING ROTARY DRILL; **3,751,177,** same, GUIDE PAD MOUNTING ON A DRILL BIT, **filed** Feb. 9, 1978, D.C., W.D. Pa. (Erie), Doc. C.A. 78–5 Erie, *Snadvik Steel of Colorado, Inc.* v. *Martin N. Hamilton, doing business as Hamilton Tool Co.*

3,298,030, Lewis and Brown, ELECTRICALLY OPERATED CHARACTER PRINTER; **3,596,275,** R. G. Sweet, SIGNAL APPARATUS, **filed** July 5, 1978, D.C., S.D. Ohio (Dayton), Doc. C-3-78-177, *Mead Digital Systems, Inc.* v. *A. B. Dick Co. and Gould, Inc.* **Same, filed** June 8, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c2271, *A. B. Dick Company, and Gould Inc.* v. *Mead Corporation.* **Same, filed** Jan. 10, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c0075, *A. B. Dick Company et al.* v. *Burroughs Corporation.*

3,297,124. (See 3,260,340.)

3,303,594, K. R. Lewis, FIREARM BARREL SHROUD FRAME, AND CYLINDER CONSTRUCTION; **3,633,302,** same, CYLINDER MECHANISM FOR REVOLVER-TYPE FIREARMS, **filed** Dec. 23, 1974, D.C. Conn. (Hartford), Doc. H-74-400, *Richard S. Pastore* v. *The Leisure Group, Inc. et al.* Stipulation and order of dismissal filed on May 23, 1978.

3,313,630. (See 3,231,512.)

3,313,631. (See 3,231,512.)

3,451,782. (See 3,231,512.)

3,361,858, O. Wichterle, RESHAPING A XEROGEL BY MECHANICAL REMOVAL AND SWELLING TO FORM A HYDROGEL CONTACT LENS; **3,822,089,** O. Wichterle, CONTACT LENS BLANK OR REPLICA MADE FROM ANHYDROUS SPARINGLY CROSS-LINKED HYDROPHILIC COPOLYMERS: **Re. 27,401.** Wichterle and Prague, CROSS-LINKED HYDROPHILIC POLYMERS AND ARTICLES MADE THEREFROM, **filed** Nov. 12, 1975, D.C. Del. (Wilmington), Doc. 75-365, *Hilton Roy Company and Milroy-Automated, Inc.* v. *Bausch & Lomb Inc. et al.* Stipulation and order, Wright, *J.*, dismissing action without prejudice, Mar. 2, 1978.

3,476,260. (See 3,164,255.)

3,408,496, Sellers and Ziegler, ALPHA RAY EXCITED COMPOSITION ANALYSIS, **filed** Oct. 6, 1978, D.C., N.D. Calif. (San Francisco), Doc. C-78-2370-SAW, *Panametrics, Inc.* v. *Kevex Corporation.*

3,490,660, R. E. Mitton, PRESSURE EQUALIZER APPARATUS FOR HYDRAULIC BRAKE FLUID SYSTEMS; **3,757,825,** Givens and Spero, PRESSURE EQUALIZING DEVICE FOR FLUID PRESSURE SYSTEMS, **filed** Feb. 9, 1978, D.C., S.D. Calif. (San Diego), Doc. 78-0087-GT, *Charles Hicks* v. *Adult Probation Dept.*

3,460,631, Friesen and Klassen and Kohman, HIGH CLEARANCE WHEEL MOUNTED SPRING-TOOTH HARROW, **filed** Oct. 13, 1976, D.C., W.D. Okla. (Oklahoma City), Doc. C76-0823-D, *Hillsboro Industries, Inc.* v. *John's Green Line, Inc. et al.* Consent decree that plaintiff is owner of all rights and title and all causes of action are dismissed, Sept. 26, 1977.

3,461,962, J. W. Harrington, PIPE STRING FILL-UP TOOL; **3,497,009,** same, CIRCULATING TOOL, **filed** July 24, 1978, D.C., W.D. La. (Shreveport), Doc. 780924-L. *Fill-Up Tool Corporation* v. *Trisco Inc.*

3,490,004. (See 3,260,340.)

3,497,009. (See 3,461,962.)

3,508,406, C. L. Fisher, COMPOSITE ARCH STRUCTURE, **filed** Sept. 21, 1978, D.C., S.D. Ohio (Cincinnati), Doc. C-1-78-602, *Middletown* v. *Republic Steel Corp. et al.*

3,509,381. (See 3,524,023.)

3,512,137. (See 3,260,340.)

3,512,654. (See 3,164,255.)

3,521,304, G. J. Ghiz, SWIMMING POOL CLEANING SYSTEM; **3,675,252,** same, POP-UP HEAD FOR WATER JET-POOL CLEANING SYSTEM, **filed** Jan. 11, 1978, D.C. Ariz. (Phoenix), Doc. C78-27-PhX WEC, *Fiestaglass Pool Products, Inc.* v. *George Ghiz and Sally L. Ghiz and Paddock Pool Construction Co.*

3,524,023, S. Y. Whang, BAND LIMITED TELEPHONE LINE DATA COMMUNICATION SYSTEM; **3,590,381,** R. G. Ragsdale, DIGITAL DIFFERENTIAL ANGLE DEMODULATOR; **3,619,503,** R. G. Ragsdale, PHASE AND AMPLITUDE MODULATED MODEM; **3,643,023,** Ragsdale and Payne, DIFFERENTIAL PHASE MODULATOR AND DEMODULATOR UTILIZING RELATIVE PHASE DIFFERENCES AT THE CENTER OF THE MODULATION PERIODS; **3,783,194,** Vilips and Lowey, DATA MODEM HAVING A FAST TURN-AROUND TIME OVER DIRECT DISTANCE DIALED NETWORKS, **filed** Jan. 13, 1978, D.C. Del. (Wilmington), Doc. 78-18, *Rixon Inc.* v. *Racal Milgo Inc.*

3,526,156, V. L. Francen, FIRE EXTINGUISHING COMPOSITION COMPRISING A FLUOROALIPHATIC SURFACTANT AND A FLUORINE FREE SURFACTANT; **3,772,195,** same, **filed** July 1, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c2381, *Minnesota Mining & Manufacturing Company* v. *The Ansul Company, et al.* Case transferred to Eastern District of Wisconsin pursuant to memorandum and order of, May 4, 1978.

3,561,934, G. Steven, SINTERED STEEL PARTICLES CONTAINING DISPERSED CARBIDES; **3,746,518,** R. C. Holtz, Jr. ALLOY COMPOSITION AND PROCESS, **filed** Apr. 27, 1978, D.C. Pa. (Pittsburgh), Doc. 78-548, *Crucible Inc.* v. *Uddeholms AB.*

3,564,526, E. O. Butts, PIPELINE LEAK DETECTION DEVICE, **filed** Sept. 15, 1978, D.C., S.D.N.Y., Doc. 78-C-4348 (HFW), *Leak "X" Detection Devices Ltd. and Leak "X" Corp. USA* v. *Walter Gorman and James Murray.*

3,581,507, R. W. Stevens, TUNNELING SHIELD, **filed** Aug. 3, 1978, D.C., E.D. Wis. (Milwaukee), Doc. 78-494, *Milwaukee Boiler Manufacturing Company* v. *Mining Equipment Manufacturing Company, also known as Memco.* Dismissed Sept. 25, 1978.

3,581,739, Brandt and Clark, MOTOR DRIVEN MUSCLE-BUILDING MACHINE; **3,936,047,** same, BODY PHYSICAL CONDITIONING MACHINE, **filed** Mar. 23, 1978, D.C. Calif. (San Francisco), Doc. C-78-0635, *Gravity Exercise Systems* v. *Gyro-Trim Inc.*

3,596,275. (See 3,298,030.)

3,605,366, G. W. Zakin, COMPOSITE LAMINATE PANEL CONSTRUCTION, **filed** Sept. 12, 1978, D.C., E.D. Pa. (Philadelphia), Doc. 78-3048, *Gerald Zakim* v. *Fidelity Mutual Girard Trust Building.*

3,617,086, King and Burton, FOLDABLE AND TRANSPORTABLE HOME; **3,738,678,** same, FLOOR FRAME STRUCTURE; **D. 225,216,** same, MODULAR HOME, **filed** Apr. 15, 1975, D.C., N.D. Ind. (South Bend), Doc. S-75-79. That this case is dismissed, Oct. 2, 1978.

3,618,606, Brown and Frank, STOMA BAG, **filed** July 21, 1978, D.C., M.D. Fla. (Tampa), Doc. 78-586-C-T.K. *Osteolite Products, Inc.* v. *Howmedica Inc.*

3,619,503. (See 3,524,023.)

3,621,371, W. R. Brumm, CURRENT PULSE STABILIZER FOR VARIABLE LOADS; **4,016,541,** Delagi and Zeh, and Lia-Shaoul, MEMORY UNIT FOR CONNECTION TO CENTRAL PROCESSOR UNIT AND INTERCONNECTING BUS; **4,045,781,** Levy and Northrup and Giggi, MEMORY MODULE WITH SELECTABLE BYTE ADDRESSING FOR DIGITAL DATA PROCESSING SYSTEM; **4,055,851,** Jenkins and Northrup, Stewart, MEMORY MODULE WITH MEANS FOR GENERATING A CONTROL SIGNAL THAT INHIBITS A SUBSEQUENT OVERLAPPED MEMORY CYCLE DURING A READING OPERATION PORTION OF A READING MEMORY CYCLE, **filed** Feb. 6, 1978, D.C. Mass. (Boston), Doc. 78-360-C, *Digital Equipment Corporation* v. *Electronic Memories & Magnetics Corp.*

3,630,336. (See 3,260,340.)

3,633,302. (See 3,303,594.)

3,633,774, W. S. Lee, ALL MOVING METHOD; **3,800,261,** same, MOVING SYSTEM, **filed** Sept. 8, 1978, D.C., W.D. Mo. (Kansas City), Doc. 78-0683-CV-W-2, *William S. Lee* v. *Clarence A. Baker.*

3,643,023. (See 3,524,023.)

3,646,696, R. Sarkisian, POSTER DISPLAY DEVICE; **3,662,482,** same, **filed** Sept. 15, 1978, D.C. Oreg. (Portland), Doc. 78-850, *Robert Sarkisian* v. *Sugn up Corp et al.*

3,650,340, R. S. Bradley, STRAIN GAGE WEIGHING DEVICE; **3,669,756,** same, VEHICLE COUPLING WEIGHING DEVICE, **filed** Sept. 19, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c3744, *Weigh-Tronix, Inc.* v. *Eaton Corp.*

3,660,163, J. R. Moser, SOLID STATE LITHIUM-IODINE PRIMARY BATTERY; **3,674,562,** Schneider and Moser, PRIMARY CELLS AND IODINE CONTAINING CATHODES THEREFOR, **filed** June 8, 1977, D.C. Minn. (Minneapolis), Doc. C-4-77-201, *Medtronic, Inc.* v. *Mine Safety Appliance Company et al.*

3,662,482. (See 3,646,696).

3,665,817, Katz and Grainger, FORMING MULTIPLE PAGE PAMPHLET; **3,713,673,** R. E. KATZ, ENVELOPE-CONTAINING MULTIPLE PAGE PAMPHLET, **filed** Feb. 12, 1974,

D.C., N.D. Ill. (Chicago), Doc. 74c413, *Webcraft Packaging, Inc. etc.* v. *Cadillac Printing & Lithographing Corp.* Enter consent decree. Cause dismissed with prejudice, Oct. 3, 1978.

3,669,756. (See 3,650,340.)

3,674,562. (See 3,660,163.)

3,675,252. (See 3,521,304.)

3,683,535. (See 3,303,594.)

3,684,871, C. A. Schaffner, NETWORK PLOTTING SYSTEM, **filed** Oct. 16, 1975, D.C., N.D. Calif. (Oakland), Doc. C–75–2185–SC, *Systonetics, Inc.* v. *Project Software & Development, Inc.* Stipulation of dismissal, Apr. 9, 1976.

3,687,061, Eggenmuller, Scherer, Notter, Bellan, Wagler, DEVICE FOR BUILDING UP AND REMOVING A FLAT MASS OF GOODS; **4,046,068,** same, APPARATUS FOR FORMING MATS OR STRANDS OF FODDER FEED MATERIAL FOR FLAT STORAGE THEREOF, **filed** Sept. 28, 1978, D.C. Nebr. (Omaha), Doc. CV78–0–424, *Gebruder Eberhardt and Midwest Silopress, Inc.* v. *Ag-Bag Corporation et al.*

3,699,633, A. H. Kidd, MACHINE FOR MAKING HANGING FILL FOLDERS; **3,700,528,** same, **filed** Aug. 11, 1976, D.C., E.D. Wis. (Milwaukee), Doc. 76–563, *Condes Corporation* v. *Converters Equipment Corporation et al.* Action dismissed Apr. 27, 1978.

3,700,528. (See 3,699,633.)

3,702,076, H. W. Georgi, ELECTRONIC THERMOMETER; **3,877,307,** same, **filed** Apr. 11, 1978, D.C., S.D. Calif. (San Diego), Doc. 78–0228–GT, *Ivac Corporation* v. *Diatek, Inc.*

3,713,673. (See 3,665,817.)

3,715,895, E. J. Devlin, DRINKING CUP FOR FREEZING A BEVERAGE TO A SLUSH-LIKE CONDITION, **filed** Feb. 20, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c442, *Glacier Ware, Inc.* v. *Goldblatt Brothers, Inc.* Joint motion of the parties for the entry of final judgment in this case is granted, Oct. 30, 1974.

3,736,036, G. Mathus, STORAGE SYSTEM FOR TAPE CASSETTES, **filed** Sept. 15, 1978, D.C., E.D.N.Y. (Brooklyn), Doc. 78–C–2059, *Data Packaging Corporation* v. *Recoton Corporation.*

3,738,678. (See 3,617,086.)

3,746,518. (See 3,561,934.)

3,751,177. (See 3,274,863.)

3,757,825. (See 3,430,660.)

3,764,994. (See 3,260,340.)

3,772,195. (See 3,562,156.)

3,772,775, Bonnke and Melcher, METHOD OF MAKING FLAT CONDUCTOR CABLE ASSEMBLIES, **filed** Apr. 7, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c1306, *Methode Electronics* v. *A. W. Industries, Inc.* Stipulation of dismissal by agreement, Apr. 7, 1978.

3,783,194. (See 3,524,023.)

3,795,557, A. Jacob, PROCESS AND MATERIAL FOR MANUFACTURING SEMICONDUCTOR DEVICES; **3,867,216,** same, **filed** Nov. 3, 1977, D.C. Mass. (Boston), Doc. 77–3374–T, *LFE Corporation* v. *Will Ross, Inc.*

3,799,224, Vizziello and Bouteiller, RAFTER BEAM NOTCHING APPARATUS; **3,841,367,** same, PLANING AND GROOVING MACHINE; **3,865,161,** same, GROOVING MACHINE, **filed** Dec. 2, 1977, D.C. Mass. (Boston), Doc. 77–3669, *Vermont Log Buildings, Inc.* v. *New England Log Homes, Inc.*

3,809,261. (See 3,633,774.)

3,811,289, M. Bassett, METHODS OF GROUTING OFFSHORE STRUCTURES; **3,832,857,** same, PRESSURE GROUTING; **3,878,687,** A. F. Tragesser, Jr., GROUTING OF OFFSHORE STRUCTURES; **Re. 28,232,** Bassett and Olsen, METHODS OF GROUTING OFFSHORE STRUCTURES, **filed** Aug. 18, 1978, D.C., W.D. La. (Shreveport), Doc. C781082–L, *C. Nelson Shields, Jr., trustee for Max and Betty R. Bassett* v. *Brown & Root, Inc. and Brown & Root Marine Operators, Inc.* Same, **filed** Jan. 20, 1978, D.C., W.D. La. (Shreveport), Doc. 780065–L, *C. Nelson Shields, Jr.* v. *Halliburton Company and Halliburton Services, Inc.*

3,822,089. (See 3,361,858.)

3,822,494, R. F. Zivica, WALL PLAQUE AND METHOD OF FABRICATING SAME; **D. 234,433,** same, FOOTBALL WALL PLAQUE, **filed** Apr. 10, 1978, D.C., E.D. Mich. (Detroit), Doc. 78–70804, *Robert F. Zivica* v. *S & S Products Engineering Service, Inc.*

3,827,428, Hon and Hon, BIPOLAR ELECTRODE STRUCTURE FOR MONITORING FETAL HEARTBEAT AND THE LIKE, **filed** Oct. 8, 1976, D.C., C.D. Calif. (Los Angeles), Doc. 76–3182–AAH, *Corometrics Medical Systems, Inc.* v. *Neward Enterprises Incorporated.*

3,832,857. (See 3,811,289.)

3,841,367. (See 3,799,224.)

3,863,034, R. Morrison, TRANSLATOR ALARM, **filed** Dec. 20, 1976, D.C., C.D. Calif. (Los Angeles), Doc. CV76–3927–LEW, *Communication Manufacturing Company* v. *G. L. Collins Corporation.* Filed consent decree and ordered thereon that defendant has infringed patent, defendants agree to permanent injunction; action dismissed with prejudice, Sept. 13, 1978.

3,863,273, R. G. Averill, ORTHOPEDIC PROSTHETIC IMPLANT DEVICES, **filed** Sept. 15, 1978, D.C. Del. (Wilmington), Doc. 78–389, *Minnesota Mining & Manufacturing Co.* v. *Medishield, Inc.*

3,867,216. (See 3,795,557.)

3,877,307. (See 3,702,076.)

3,878,687. (See 3,811,289.)

3,887,268, Golden and Kennedy, FLASHING REFLECTION SYSTEM, **filed** Oct. 14, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c3451, *Beatrice Foods Co.* v. *Tsuyama Mfg. Co. Ltd.* Defendants' motion for summary judgment is granted, May 31, 1978.

3,897,597, D. R. Kasper, FACE AND HEAD PROTECTOR, **filed** Dec. 2, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c4486, *Margaret Elizabeth Kasper* v. *Herman's World of Sporting Goods and MGS Inc.*

3,906,658, S. Gross, MAGNETIC TOY HAVING SCULPTURABLE PONTICLES, **filed** Feb. 24, 1978, D.C., C.D. Calif. (Los Angeles), Doc. CV78–748–RMT(Rx), *Sam Gross* v. *Loncraine Broxton and Partners, Limited.* Filed stipulation for entry of consent judgment, June 6, 1978.

3,935,947, W. T. Barrett, MAGNETIC REFUSE SEPARATOR; **4,008,799,** same, CONVEYOR BELT WEAR PROTECTION, **filed** Sept. 8, 1978, D.C., S.D. Fla. (Miami), Doc. 78–4271–C–JAG, *Wehr Corporation* v. *Commercial Construction Corporation.*

3,936,047. (See 3,581,739.)

3,954,273, Shaper and Litcher, PHONOGRAPH PICKUP CARTRIDGE, **filed** July 5, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c2391, *Empire Scientific Corporation* v. *Shure Brothers, Inc.* Case dismissed pursuant to stipulation, Nov. 3, 1977.

3,991,405. (See 3,260,340.)

4,008,799. (See 3,935,947.)

4,011,431, M. L. Levin, ELECTRIC COOKING APPLIANCE WITH REVERSIBLE GRILL, **filed** Feb. 15, 1978, D.C., C.D. Calif. (Los Angeles), Doc. CV78–621–LTL–(Sx), *Winnie Mae Manufacturing Co., Inc.* v. *Scovill Manufacturing Company.* Claims of plaintiff against defendant are dismissed with prejudice, Apr. 5, 1978.

4,016,541. (See 3,621,371.)

4,030,873, D. R. Morrison, VIBRATING CONCRETE SCREED, **filed** Aug. 18, 1978, D.C., W.D.N.C. (Asheville), Doc. C–C–78–0243, *Donald R. Morrison* v. *Lewis T. Morrison.*

4,033,461, B. B. Neval, CLEANING AND DRAINING DEVICE FOR SINK; **D. 244,827,** same, **filed** Aug. 5, 1977, D.C., N.D. Ohio (Cleveland), Doc. C–77–833, *Transco Plastics Corporation* v. *Belaco International Ltd.*

4,037,476, J. McCrabb, GRAIN SAMPLING PROBE, **filed** July 28, 1977, D.C., S.D. Iowa (Des Moines), Doc. 77–223–2, *McCrabb Bros. Mfg. Inc.* v. *M.M.C. Enterprises, Inc. and Larry Martin.* Voluntary dismissal without prejudice of plaintiff's complaint and defendant's counterclaims and order filed Aug. 31, 1978.

4,037,680, C. E. Grove, APPARATUS FOR ADJUSTING CAMBER, **filed** Sept. 11, 1978, D.C. Minn. (Minneapolis), Doc. 4–78–C 386, *Clinton E. Grove* v. *Shim-A-Line Inc. et al.*

4,040,098, Beeson and Skinner, EDITING SYSTEM FOR CONTROLLING THE TRANSFER OF SELECTED VIDEO INFORMATION FROM A VIDEO SOURCE TO A VIDEO TAPE RECORDER, **filed** Jan. 25, 1978, D.C., C.D. Calif. (Los Angeles), Doc. CV78–0359–MML, *Convergence Corporation* v. *Sony Corporation of America.* Same, **filed** Mar. 3, 1978, D.C., N.D. Calif. (San Francisco), Doc. C78–476–WHO, *Convergence*

Corporation v. *Television Research International, Inc.* Enter default of defendant and judgment be made and entered in favor of plaintiff, Sept. 7, 1978.

4,045,781. (See 3,621,371.)

4,046,668. (See 3,687,061.)

4,055,851. (See 3,621,371.)

4,062,993, W. W. Seward, TEXTILE AND METHOD OF MAKING SAME, **filed** Apr. 13, 1978, D.C., E.D. Tenn. (Chattanooga), Doc. C1–78–85, *William W. Seward* v. *Martin Processing, Inc.* Dismiss without prejudice, June 22, 1978.

4,073,513, J. Blakeley, PIPE BRANCH FITTING, **filed** June 27, 1978, D.C. (District of Columbia), Doc. 77–1188, *Victaulic Company* v. *James Blakeley.*

Re. 27,366, E. R. Dunn, PROCESS OF MAKING SOLID FOAMS FROM POLYMERS EMULSIONS, **filed** Oct. 29, 1975, D.C. Ga. (Rome), Doc. C75–143R, *Ludlow Corporation* v. *Textile Rubber & Chemical Company Inc. and Harvey Howalt.*

Re. 27,401. (See 3,361,858.)

Re. 28,232. (See 3,811,289.)

Re. 28,744. (See 3,912,198.)

D. 170,009, Cripe and Petersen, COMBINED BACKGROUND AND SHELF FOR STOVES, **filed** Aug. 11, 1978, D.C., S.D. Fla. (Miami), Doc. 78–3682–C–WMH, *Donald Underwood and Underwood's Hair Adaption Process, Inc.* v. *J. Sperling et al.*

D. 225,216. (See 3,617,086.)

D. 234,433. (See 3,822,494.)

D. 243,217, E. E. Warsaw, SOFA, **filed** Sept. 11, 1978, D.C., C.D. Calif. (Los Angeles), Doc. C78–3481–RF (KX), *Sheffield Furniture Corp.* v. *Allied Upholstery Company.* **Same, filed** Sept. 11, 1978, D.C., C.D. Calif. (Los Angeles), Doc. 78–3576, *Sheffield Furniture Corp.* v. *Touch of Class Furniture Manufacturing, Inc.* **Same, filed** May 17, 1977, D.C., C.D. Calif. (Los Angeles), Doc. 77–1000 DWW, *Sheffield Furniture Corp.* v. *Cal Custom Designs.* **Same, filed** Mar. 2, 1978, D.C., C.D. Calif. (Los Angeles), Doc. CV78–809–AAH (SX), *Sheffield Furniture Corp.* v. *Cal-Sofa Inc.* **Same, filed** Feb. 1, 1978, D.C., E.D. Wash. (Spokane), Doc. C–78–32, *Sheffield Furniture Corp.* v. *Mount Adams Furniture.* Stipulation to consent judgment, Sept. 29, 1978.

D. 244,827. (See 4,033,461.)

D. 246,374, L. B. Schwartz, HANDBAG, **filed** Apr. 3, 1978, D.C. Conn. (Bridgeport), Doc. B–78–132, *Acricite Co. Inc.* v. *Bradless, Inc.* Plaintiff withdrew action as to all parties, May 16, 1978. **Same, filed** Apr. 25, 1978, D.C. Conn. (Bridgeport), Doc. B–78–163, *Acricite Co., Inc.* v. *Kinney Shoes Corp.* **Same, filed** Apr. 25, 1978, D.C. Conn. (Bridgeport), Doc. B–78–164, *Acricite Co., Inc.* v. *Barker Corp.* **Same, filed** Apr. 27, 1978, D.C., Conn. (Bridgeport), Doc. B–78–166, *Acricite Co., Inc.* v. *Caldor, Inc.* **Same, filed** Apr. 5, 1978, D.C., S.D.N.Y., Doc. 78–C–1528 Ktd, *Acricite Company, Inc.* v. *Ohio Bag Corporation.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,242,150, Re. S.N. 933,385, Filed Aug. 11, 1978, Cl. 526/64, METHOD AND APPARATUS FOR THE RECOVERY OF SOLID OLEFIN POLYMER FROM A CONTINUOUS PATH REACTION ZONE, Jack S. Scoggin, Owner of Record: *Phillips Petroleum Company, Bartlesville, Okla.,* Attorney or Agent: Donald J. Quigg, et al., Ex. Gp.: 144

3,411,559, Re. S.N. 959,577, Filed Nov. 13, 1978, Cl. 152/209 R, TREAD FOR A GIANT PNEUMATIC RADIAL TIRE, Henri Verdier, Owner of Record: *Compagnie Generalde des Establissements Michelin, Raison Societe Michelin & Cie, Clermont-Ferrand, Poly-de-Dome, France,* Attorney or Agent: Granville M. Brumbaugh, et al., Ex. Gp.: 316

3,701,173, Re. S.N. 950,809, Filed Oct. 12, 1978, Cl. 5/349, INFLATABLE BODY SUPPORT, John K. Whitney, Owner of Record: *Medisearch Pr., Inc., Guayama, Puerto Rico,* Attorney or Agent: Morton Amster, et al., Ex. Gp.: 351

3,708,726, Re. S.N. 960,131, Filed Nov. 13, 1978, Cl. 361/156, INDUCTOR DRIVE MEANS, John M. Puvogel, Owner of Record: *The National Cash Register Company, Dayton, Ohio,* Attorney or Agent: J. T. Cavender, et al., Ex. Gp.: 212

3,973,480, Re. S.N. 932,886, Filed Aug. 10, 1978, Cl. 99/359, APPARATUS AND METHOD FOR CANNING FOOD, Ariel A. Andersen, Owner of Record: *Phillip V. Christensen, benefit of The Foundation For Indian Development, Inc., Provo, Utah,* Attorney or Agent: Lynn G. Foster, et al., Ex. Gp.: 242

3,985,406, Re. S.N. 950,002, Filed Oct. 6, 1978, Cl. 308/219, CUSHIONED ROLLER CIRCLE, George B. Baron, Owner of Record: *Marion Power Shovel Company, Inc., Marion, Ohio,* Attorney or Agent: Peter N. Lalos, Ex. Gp.: 315

3,992,593, Re. S.N. 960,257, Filed Nov. 13, 1978, Cl. 179/100.3 V, DISC PHONOGRAPH RECORD PLAYBACK BY LASER GENERATED DIFFRACTION PATTERN, William K. Heine, Owner of Record: *Inventor,* Attorney or Agent: Karl A. Limbach, et al., Ex. Gp.: 235

4,003,699, Re. S.N. 953,688, Filed Oct. 23, 1978, Cl. 8/102, OXIDATION HAIR DYES BASED UPON TETRAAMINOPYRIMIDINE DEVELOPERS, David Rose, Owner of Record: *Henkel & Cie GmbH, Dusseldorf, Germany,* Attorney or Agent: Nelson Littell, Ex. Gp.: 125

4,012,983, Re. S.N. 957,037, Filed Nov. 2, 1978, Cl. 84/400, ACOUSTICAL REFLECTOR FOR WIND INSTRUMENTS, Thomas L. Ploeger, Owner of Record: *Inventor,* Attorney or Agent: Arthur Raisch, et al., Ex. Gp.: 211

4,030,508, Re. S.N. 950,533, Filed Oct. 11, 1978, Cl. 128/418, LOW OUTPUT ELECTRODE FOR CARDIAC PACING, Hilbert J. Th. Thalen, Owner of Record: *Vitatron Medical B.V., Dieren, Netherlands,* Attorney or Agent: Albert W. Preston, Jr., Ex. Gp.: 335

4,037,848, Re. S.N. 959,941, Filed Nov. 13, 1978, Cl. 277/37, LUBRICANT SEAL, David B. Prescott, Owner of Record: *The Mechanex Corporation, Englewood, Colo.,* Attorney or Agent: Thomas E. Torphy, et al., Ex. Gp.: 241

4,055,873, Re. S.N. 946,097, Filed Sep. 26, 1978, Cl. 24/3 C, ACCESSORY HOLDER FOR USE ON ARTICLE OF CLOTHING, Robert A. Kallman, Owner of Record: *Kallman Research Corporation, Weatogue, Conn.,* Attorney or Agent: Morris Relson, et al., Ex. Gp.: 351

4,068,499, Re. S.N. 960,609, Filed Nov. 13, 1978, Cl. 64/8, TELESCOPING UNIVERSAL JOINTS, Everett H. Sharp, Owner of Record: *Inventor,* Attorney or Agent: Arthur Raisch, et al., Ex. Gp.: 345

4,074,582, Re. S.N. 958,696, Filed Nov. 8, 1978, Cl. 74/230.24, HOISTING DEVICE, Manfred Harig, Owner of Record: *N.V. Western Gear Europe S.A., Aartselaar, Belgium,* Attorney or Agent: Howard E. Sandler, et al., Ex. Gp.: 352

4,080,958, Re. S.N. 958,975, Filed Nov. 9, 1978, Cl. 128/1 D, APPARATUS FOR AIDING AND IMPROVING THE BLOOD FLOW IN PATIENTS, David Bregman, et

al., Owner of Record: *Datascope Corporation, Paramus, N.J.*, Attorney or Agent: Arthur D. Gray, et al., Ex. Gp.: 335

4,082,145, Re. S.N. 958,836, Filed Nov. 8, 1978, Cl. 166/251, DETERMINING THE LOCUS OF A PROCESSING ZONE IN AN IN SITU OIL SHALE RETORT BY SOUND MONITORING, W. Brice Elkington, Owner of Record: *Occidental Oil Shale, Inc., Grand Junction, Calif.*, Attorney or Agent: Robert L. Parker, et al., Ex. Gp.: 354

4,114,428, Re. S.N. 951,995, Filed Oct. 16, 1978, Cl. 73/88 F, RADIO-FREQUENCY TUNED-CIRCUIT MICRO-DISPLACEMENT TRANSDUCER, Charles H. Popenoe, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 244

PATENT NOTICES

Certificates of Correction for the Week of January 9, 1979

Re. 29,687	4,078,060	4,096,996	4,114,935
D. 247,898	4,078,061	4,097,281	4,115,096
3,765,956	4,078,244	4,097,670	4,115,310
3,936,494	4,080,433	4,098,029	4,115,317
3,951,979	4,080,589	4,098,807	4,115,557
4,003,278	4,081,344	4,099,339	4,115,956
4,003,894	4,082,738	4,099,625	4,116,422
4,020,227	4,085,085	4,100,324	4,117,055
4,048,191	4,085,754	4,100,624	4,117,063
4,061,625	4,086,081	4,101,130	4,117,521
4,065,290	4,086,256	4,101,153	4,117,601
4,065,735	4,086,689	4,101,324	4,117,935
4,069,220	4,087,468	4,103,094	4,118,165
4,070,021	4,089,610	4,113,674	4,120,477
4,072,747	4,092,255	4,113,731	4,120,993
4,073,722	4,092,392	4,113,892	4,122,181
4,073,767	4,093,783	4,113,959	4,122,672
4,073,840	4,093,943	4,114,379	4,124,533
4,076,395	4,093,946	4,114,679	
4,077,541	4,096,128	4,114,710	

Disclaimers

3,302,338.—*Louis H. Barnett* and *Robert U. Lane*, Fort Worth, Tex. MOLD POLISHING METHOD. Patent dated Feb. 7, 1967. Disclaimer filed Oct. 6, 1978, by the assignee, *Vistron Corporation*.

Hereby enters this disclaimer to all claims of said patent.

3,314,639.—*Louis H. Barnett*, Fort Worth, Tex. MOLD FOR ROTATABLE CASTING. Patent dated Apr. 18, 1967. Disclaimer filed Oct. 6, 1978, by the assignee, *Vistron Corporation*.

Hereby enters this disclaimer to all claims of said patent.

3,315,314.—*Louis H. Barnett* and *Henry P. Horton*, Fort Worth, Tex. THERMODYNAMIC MOLDING MACHINE. Patent dated Apr. 25, 1967. Disclaimer filed Oct. 6, 1978, by the assignee, *Vistron Corporation*.

Hereby enters this disclaimer to all claims of said patent.

3,388,429.—*Louis H. Barnett* and *Henry P. Horton*, Fort Worth, Tex. THERMODYNAMIC CASTING MACHINE. Patent dated June 18, 1968. Disclaimer filed Oct. 6, 1978, by the assignee, *Vistron Corporation*.

Hereby enters this disclaimer to all claims of said patent.

3,950,512.—*Jerrell Bemis Emery*, Chalfont, and *James Long Bittle*, Doylestown, Pa. ANIMAL VACCINES. Patent dated Apr. 13, 1976. Disclaimer filed Nov. 2, 1978, by the assignee, *Pitman-Moore, Inc.*

Hereby enters this disclaimer to claims 23 and 24 of said patent.

4,032,929.—*Kenneth H. Fischbeck*, Dallas, and *Richard H. Vernon*, Richardson, Tex. HIGH DENSITY LINEAR ARRAY INK JET ASSEMBLY. Patent dated June 28, 1977. Disclaimer filed Nov. 22, 1978, by the assignee, *Xerox Corporation*.

Hereby enters this disclaimer to claims 19, 20 and 21 of said patent.

4,050,967.—*Wojciech Rosnowski*, Summit, and *Samuel Ponczak*, Somerville, N.J. METHOD OF SELECTIVE ALUMINUM DIFFUSION. Patent dated Sept. 27, 1977. Disclaimer filed Nov. 3, 1978, by the assignee, *RCA Corporation*.

Hereby enters this disclaimer to all claims of said patent.

4,090,489.—*Lynn M. Barker*, Salt Lake City, Utah. FRACTURE TOUGHNESS TEST METHOD. Patent dated May 23, 1978. Disclaimer filed Oct. 26, 1978, by the assignee, *Reed Tool Company*.

Hereby enters this disclaimer to all claims of said patent.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The invention listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF THE ARMY
Intellectual Property Division, OTJAG, Pentagon, Room 2D 444, Washington, D.C. 20314

Patent 4,050,019. Range Switching Circuit for Solid State Electrometer. Filed July 26, 1976. Patented Sept. 20, 1977. Not available NTIS.

Patent 4,050,040. Fast-Tuned Multiplexer-Power Combiner. Filed Oct. 12, 1976. Patented Sept. 20, 1977. Not available NTIS.

Patent 4,050,069. Transponder Based Landing System. Filed Sept. 2 1976. Patented Sept. 20, 1977. Not available NTIS.

Patent 4,056,290. Method of Changing the Frequency of a Laser Beam. Filed Mar. 18, 1976. Patented Nov. 1, 1977. Not available NTIS.

Patent 4,056,649. Abrasion Resistant Optical Materials and Process for Making Same. Filed Sept. 24, 1976. Patented Nov. 1, 1977. Not available NTIS.

Patent 4,060,170. Tire Mount-Dismount Mechanism. Filed Oct. 8, 1976. Patented Nov. 20, 1977. Not available NTIS.

Patent 4,060,767. Self Test Circuit for Multichannel Radio Receivers. Filed Nov. 10, 1976. Patented Nov. 29, 1977. Not available NTIS.

Patent 4,060,810. Loaded Microstrip Antenna. Filed Oct. 4, 1976. Patented Nov. 19, 1977. Not available NTIS.

Patent 4,061,426. Optical Alignment Device and Method of Use. Filed Mar. 5, 1978. Patented Dec. 6, 1977. Not available NTIS.

Patent 4,061,842. Fail Safe Battery. Filed Nov. 26, 1976. Patented Dec. 6, 1977. Not available NTIS.

Patent 4,062,329. Fan Drive System. Filed July 29, 1976. Patented Dec. 13, 1977. Not available NTIS.

Patent 4,062,508. Integrated Helicopter Flight Control. Filed Aug. 10, 1976. Patented Dec. 13, 1977. Not available NTIS.

Patent 4,063,096. Self-Protecting Infrared Detector With a Continuously Variable Attenuator. Filed Jan. 3, 1977. Patented Dec. 13, 1977. Not available NTIS.

Patent 4,063,297. Electric Arc Interrupter and Circuit Breaker. Filed Nov. 9, 1976. Patented Dec. 13, 1977. Not available NTIS.

Patent 4,063,467. Speed Change and Reverser Device. Filed June 9, 1976. Patented Dec. 20, 1977. Not available NTIS.

Patent 4,064,407. Pulse Voltage Regulator. Filed Dec. 20, 1976. Patented Dec. 20, 1977. Not available NTIS.

Patent 4,065,207. Programmable Power Attenuator for Continuous CO_2 Lasers. Filed Sept. 17, 1976. Patented Dec. 27, 1977. Not available NTIS.

Patent 4,065,211. Precision X-Ray Diffraction System Incorporating a Laser Aligner. Filed Mar. 1, 1976. Patented Dec. 27, 1977. Not available NTIS.

Patent 4,065,370. Method of Ion Plating a Thin Metallic Strip for Flashlamp Starting. Filed Jan. 28, 1977. Patented Dec. 27, 1977. Not available NTIS.

Patent 4,065,550. Process for Preparing Lithium Hexafluoroarsenate of High Purity. Filed Jan. 31, 1977. Patented Dec. 27, 1977. Not available NTIS.

Patent 4,071,678. Random Copolymers of Methyl Methacrylate and N-Octadecyl Methacrylate. Filed Apr. 29, 1976. Patented Jan. 31, 1978. Not available NTIS.

Patent 4,072,702. Tri-Functional Isocyanate Crosslinking Agents for Hydroxy-Terminated Polybutadiene Binders. Filed Dec. 6, 1976. Patented Feb. 7, 1978. Not available NTIS.

Patent 4,072,774. Sealing Method for Porous Material. Filed June 18, 1975. Patented Feb. 7, 1978. Not available NTIS.

Patent 4,075,983. Electronic Circuitry for Maintaining Constant Engine Speed Fuel Injection. Filed Aug. 25, 1976. Patented Feb. 28, 1978. Not available NTIS.

Patent 4,079,923. Vehicle Suspension Employing a Liquid Spring. Filed Sept. 16, 1976. Patented Mar. 21, 1978. Not available NTIS.

Patent 4,079,963. Vehicle Suspension Height Control. Filed Sept. 7, 1976. Patented Mar. 21, 1978. Not available NTIS.

Patent 4,081,373. Mechanism for Exhausting Impurities From Engine Fuel. Filed May 26, 1977. Patented Mar. 28, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE AIR FORCE

AF/JACP, 1900 Half St. SW., Washington, D.C. 20324

Patent application 902,134. Impact Sound Stressing Holding Assembly. Filed May 2, 1978.

Patent application 902,193. Metal Bleed Flow-Heat Exchanger. Filed May 2, 1978.

Patent application 902,523. Remotely Controlled Electromagnetic Optical Focusing Assembly. Filed May 3, 1978.

Patent application 902,525. Aromatic Heterocyclic Polymer Alloys and Products Produced Therefrom. Filed May 3, 1978.

Patent application 904,847. Fretting Fatigue Inhibiting Method for Titanium. Filed May 11, 1978.

Patent application 909,151. Composite Structures and Method of Detecting Mechanical Damage Thereto. Filed May 24, 1978.

Patent application 910,995. A Method of Obtaining Spectral Transmission Signatures. Filed May 30, 1978.

Patent application 911,746. Organosilicon Infiltrated Reaction Sintered Silicon Nitride. Filed June 2, 1978.

Patent application 913,160. Floated, Internally Gimballed Platform Assembly. Filed June 6, 1978.

Patent application 913,186. Surface Barrier Tailoring of Semiconductor Devices. Filed June 6, 1978.

Patent application 913,990. Test Probe Tool for Printed Circuit Boards. Filed June 9, 1978.

Patent application 915,709. Backlash Filter Apparatus. Filed June 15, 1978.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research, Code 302, Arlington, Va. 22217

Patent application 835,766. Submersible Battery Apparatus. Filed Sept. 22, 1977.

Patent application 875,062. Immersed Reticle. Filed Feb. 6, 1978.

Patent application 882,699. Immitance Measurement With High Frequency Injection and Electromagnetic Coupling. Filed Mar. 2, 1978.

Patent application 894,059.. Acousto-Optic Modulator. Filed Apr. 6, 1978.

Patent application 900,470. Fluid Cutout Valve. Filed Apr. 27, 1978.

Patent application 903,339. Phase Controlled Shuttering System. Filed May 5, 1978.

Patent application 907,067. Polymeric Binders Which Reversibly Dissociate at Elevated Temperatures. Filed May 18, 1978.

Patent 4,079,372. Serial to Parallel Converter. Filed May 3, 1976. Patented Mar. 14, 1978. Not available NTIS.

Patent 4,081,672. Low-Loss Signal Coupler for Optical Communications and Integrated Optics. Filed Oct. 4, 1976. Patented Mar. 28, 1978. Not available NTIS.

Patent 4,083,046. Electric Monomicrostrip Dipole Antennas. Filed Nov. 10, 1976. Patented Apr. 4, 1978. Not available NTIS.

Patent 4,084,065. Antistrumming Cable. Filed Dec. 2, 1976. Patented Apr. 11, 1978. Not available NTIS.

Patent 4,086,540. Translating Filter. Filed Feb. 9, 1977. Patented Apr. 25, 1978. Not available NTIS.

Patent 4,086,560. Secret Depth Sounder. Filed Apr. 3, 1959. Patented Apr. 25, 1978. Not available NTIS.

Patent 4,086,592. Digital Sidelobe Canceller. Filed July 22, 1977. Patented Apr. 25, 1978. Not available NTIS.

Patent 4,087,257. High Density-High Volumetric Heating Value Liquid Ramjet. Filed Mar. 21, 1977. Patented May 2, 1978. Not available NTIS.

Patent 4,087,373. Novel Method for the Production of Hydrogen and Hydrogen-Carbon Monoxide Mixtures. Filed July 23, 1976. Patented May 2, 1978. Not available NTIS.

Patent 4,087,590. Pressure-Equalized Electrochemical Battery System. Filed May 4, 1977. Patented May 2, 1978. Not available NTIS.

Patent 4,087,591. Pyrotechnically Activated Lithium-Chlorine Cell Having a Lithium Vapor Barrier. Filed Dec. 30, 1976. Patented May 2, 1978. Not available NTIS.

Patent 4,087,745. Technique for Contactless Characterization of Semiconducting Material and Device Structures. Filed July 28, 1977. Patented May 2, 1978. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters, NASA Code GP–2, Washington, D.C. 20546

Patent application 929,083. Laser Doppler Velocity Simulator. Filed July 28, 1978.

Patent application 929,088. Method of Forming a Sharp Edge on an Optical Device. Filed July 28, 1978.

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before January 28, 1979.

Bochnovic, John, Smart & Biggar, 70 Gloucester St., Ottawa, Ontario, Canada

Kelly, Thomas R., Smart & Biggar, 70 Gloucester St., Ottawa, Ontario, Canada

Sarginson, C. Lloyd, Rogers, Bereskin & Parr, P.O. Box 313, Commerce Court Postal Station, Toronto, Ontario, Canada

Suter, Ronald E., Boeing Commercial Airplane Co., P.O. Box 3707, Seattle, Wash. 98124

Wheeler, Michael Eric, Fetherstonhaugh & Co., 70 Gloucester St. Ottawa, Ontario, Canada

LUTRELLE F. PARKER,

Dec. 7, 1978. *Chairman, Committee on Enrollment.*

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before February 23, 1979.

LUTRELLE F. PARKER,

Chairman, Committee on Enrollment.

A

Abell, Gurdon R., Vinland Perrin Rd., RR1, Woodstock, Conn. 06281

Adams, Wesley T. III, 1641 Sterling Rd., Charlotte, N.C. 28209

Aka, Gary T., 1242 Henderson Ave., Sunnyvale, Calif. 94086

Anderson, David W., 7724 N. Ashland, Chicago, Ill. 60626

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These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

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State	*Name of Library*	*Telephone Contact*
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	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
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Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF NOVEMBER 18, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	12-19-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-16-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	5-1-78
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-29-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-19-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	5-16-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	6-17-77
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	11-22-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	5-1-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	2-17-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	1-17-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	10-3-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	1-16-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors: Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	8-11-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	10-6-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors: Miscellaneous Hardware; Locks; Building Structures: Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	9-2-77

Expiration of patents: The patents within the range of numbers indicated below expire during November 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,007,169 to 3,001,168, inclusive
Plant Patents..... Numbers 2,101 to 2,107, inclusive

REISSUES

JANUARY 9, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,877

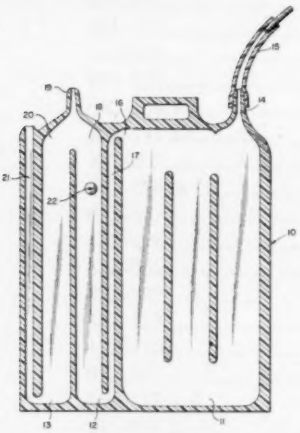
VALVED UNDERWATER DRAINAGE APPARATUS

Leonard D. Kurtz, Woodmere, and Robert E. Bidwell, Melville, both of N.Y., assignors to Deknatel Inc., Queens Village, N.Y.

Original No. 3,853,128, dated Dec. 10, 1974, Ser. No. 269,962, Jul. 10, 1972. Application for reissue Jun. 22, 1977, Ser. No. 808,982

Int. Cl.[2] A61F *5/44*

U.S. Cl. 128—275 **4 Claims**



1. In an underwater drainage device for draining fluid from a pleural cavity comprising a collection chamber having an inlet, a thoracotomy tube interconnecting the pleural cavity and the inlet to said collection chamber whereby the collection chamber receives and collects fluids drained from the pleural cavity, an outlet from the collection chamber, a U-shaped water seal chamber, a U-shaped manometer chamber, the upper end of one arm of the U-shaped water seal chamber being connected to the outlet from the collection chamber, the upper end of the other arm of the U-shaped water seal chamber being connected to the upper end of one arm of the U-shaped manometer chamber, the other arm of the U-shaped manometer chamber being open to atmosphere, a connection from said device with a source of suction, during normal operation the source of suction maintaining the pleural cavity at a negative pressure determined by the fluid in the manometer chamber, and *check* valve means *disposed* in said device *between the water seal of the water seal chamber and the lower part of the U-shaped manometer chamber on the normally lower pressure side thereof,* said *check* valve means being normally closed and opening only during sudden abnormal conditions when the pressure within the pleural cavity exceeds atmospheric pressure, said valve means being an outlet to atmosphere in addition to the outlet to atmosphere provided by the arm of the U-shaped manometer chamber open to atmosphere, said valve means being positioned in said device to vent to atmosphere sudden positive pressure surges within the pleural cavity occurring even during normal operation of the suction source and to prevent said sudden positive pressure surges from causing fluid within the U-shaped manometer chamber from passing out through the arm open to atmosphere to vary the degree of vacuum imposed by the source of suction.

Re. 29,878

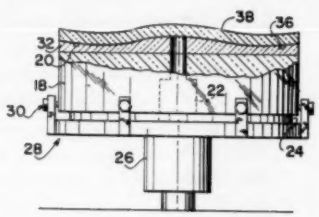
METHOD FOR MAKING REPLICA CONTOUR BLOCK MASTERS FOR PRODUCING SCHMIDT CORRECTOR PLATES

Thomas J. Johnson, Palos Verdes Estates, and John F. O'Rourke, Torrance, both of Calif., assignors to Celestron Pacific, Torrance, Calif.

Original No. 3,837,124, dated Sep. 24, 1974, Ser. No. 400,994, Sep. 26, 1973. Application for reissue Jan. 20, 1976, Ser. No. 650,636

Int. Cl.[2] B24B *13/00, 1/00*

U.S. Cl. 51—283 R **17 Claims**



1. A method for making replica contour block masters for use in producing Schmidt correctors comprising:

A. mounting a corrector plate to be duplicated, having a flat side and a contoured side, on a flat surfaced spindle master in flat side to flat surfaced contact;

B. mounting a flat surfaced piece of glass to constitute a replica piece on the corrector plate;

C. introducing a vacuum between said corrector plate and said replica piece to conform mating surfaces thereof;

D. grinding and polishing the upper free surface of said replica piece flat;

E. releasing the vacuum; and

F. removing said corrector plate and replica piece from said spindle master, the replica piece being corresponded in contour on one side to said corrector plate, and constituting a component for use as a contour block master.

PATENTS

GRANTED JAN. 9, 1979

ERRATA

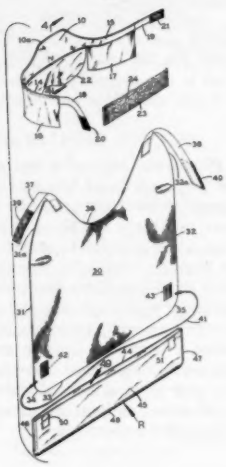
For CLASS	See PATENT NO.
036–007.8	4,133,086
209–565	4,133,098
049–049	4,133,140
405–263	4,133,179
405–170	4,133,180
405–159	4,133,181
405–169	4,133,182
141–001	4,133,281
131–003	4,133,317
131–173	4,133,318
131–241	4,133,319
181–114	4,133,409
400–154.5	4,133,422
123–117 D	4,133,475
227–065	4,133,541
180–054 A	4,133,547
422–032	4,133,638
422–078	4,133,641
422–067	4,133,642
422–182	4,133,643
422–138	4,133,644
422–220	4,133,645
073–361	4,133,700
260–112.5 R	4,133,753
521–167	4,133,780
521–154	4,133,781
528–230	4,133,801
528–502	4,133,802
528–340	4,133,803
546–096	4,133,812
562–503	4,133,829
568–558	4,133,835
568–596	4,133,836
423–432	4,133,894
219–121 P	4,133,987
219–121 P	4,133,988
354–105	4,134,105

PATENTS

GRANTED JANUARY 9, 1979

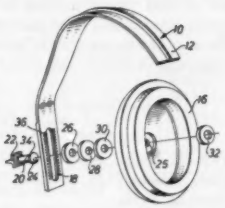
GENERAL AND MECHANICAL

4,133,052
PROTECTIVE ARRANGEMENT FOR BEAUTY SALON PATRON
Elizabeth L. Hodgman, Rt. 2, Box 231, Crawfordville, Fla., 32327 and Robert O. Hodgman, Lauderdale-by-the-Sea, Fla., assignors to Elizabeth L. Hodgman, Crawfordville, Fla.
Filed Dec. 9, 1977, Ser. No. 859,121
Int. Cl.[2] A42B *1/18*
U.S. Cl. 2—174 **18 Claims**



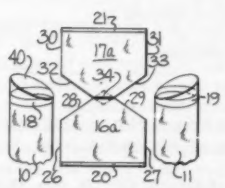
1. A hair treatment accessory comprising:
a flexible cape of moisture-resistant and heat-resistant material shaped and dimensioned to cover the back of the wearer's neck, said cape having a top edge which is downwardly offset at the middle to provide a concave edge segment which closely fits the back of the wearer's head substantially beneath the hair;
elongated flexible tie members attached to the top of the cape on opposite sides of said downwardly-offset, middle segment of the top edge of the cape, said tie members carrying manually separable fastener elements located away from their respective attachments to the cape, said fastener elements being engageable with each other in front of the wearer's forehead to hold the cape on the wearer's head;
an open-topped receptacle which is substantially as wide as the cape from side to side, said receptacle having an inner flap for attachment to the lower end of the cape and an outer flap connected to the inner flap at the opposite sides and at the bottom of the latter to form with said inner flap a trough which is open at the top for catching liquid running down the cape from the wearer's hair;
and manually separable fastener elements on the lower end of the cape and said inner flap for attaching said receptacle to the cape with the lower end of the cape extending down into said receptacle.

4,133,053
EAR-PADS AND ASSEMBLY PROCEDURE
Tord R. Lundin, Billesholm, Sweden, assignor to Gullfiber AB, Sweden
Filed Sep. 28, 1977, Ser. No. 837,084
Claims priority, application Sweden, Sep. 30, 1976, 7610882
Int. Cl.[2] A41D *21/00*
U.S. Cl. 2—209 **5 Claims**



1. A method of assembling a casing for ear-pads on one end of a flexible headband provided with slots, and making use of an element similar to a rivet, comprising
providing a rivet-like element having widened ends of greater diameter than the breadth of the slot in said headband, and
forcing one end of this element which is in the form of a head, successively through said slot in the headband by motion of the element relative to the headband, through the bores in one or more washer-like supporting elements, so that the elements are brought into position around the shaft of the rivet-like element on the inside of the headband, through a hole provided in the casing, and through one or more additional washer-like supporting elements, the diameter of whose holes is less than that of the head, and which are positioned between the inner wall of the casing and the underside of the head, thereby enabling the casing to be secured between the first-named and said additional supporting elements.

4,133,054
LOWER BODY GARMENT AND METHOD
Oris E. Harper, Asheboro, N.C., assignor to Rampon Products, Incorporated, Asheboro, N.C.
Filed Jul. 15, 1977, Ser. No. 815,945
Int. Cl.[2] A41B *9/04*
U.S. Cl. 2—407 **6 Claims**



4. A lower body garment covering at least the lower trunk and upper portions of the legs of the wearer and formed from a pair of knit seamless blanks, said garment comprising
(a) a panty portion including a single piece front panel formed from the upper end of one of said seamless blanks, and a single piece rear panel formed from the upper end of the other of said seamless blanks,
(b) each of said panels including an upper selvage edge with parallel cut opposite sides, and inclined cut edges inwardly and downwardly from said cut opposite sides,

(c) means joining the lowermost portions of the inclined cut edges of said front and rear panels to form a crotch area in said panty portion,

(d) seam means joining corresponding cut opposite sides of said front and rear panels to provide a pair of leg openings and a single waist opening,

(e) a pair of seamless legs including angularly disposed upper ends formed when said front and rear panels are cut from said seamless blanks so that they correspond with said inclined cut edges of said front and rear panels, and

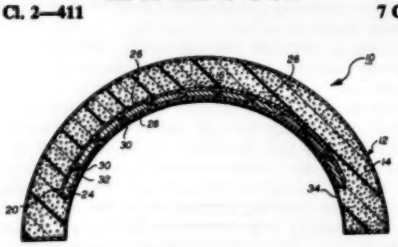
(f) seam means joining the angularly disposed upper ends of said seamless legs to the leg openings of said panty portion with the longer portions of the upper ends of said legs being joined to said panty portion at the seam means joining opposite sides of said front and rear panels with the shorter portions of the upper ends of said legs being joined to the leg openings at the crotch area of said panty portion.

4,133,055

PROTECTIVE HELMET WITH THERMAL LINER

William H. Zebuhr, Nashua, N.H., assignor to Energy Systems Corporation, Nashua, N.H.

Filed Aug. 3, 1977, Ser. No. 821,506
Int. Cl.[2] A42B *3/00, 1/00*
U.S. Cl. 2—411 **7 Claims**



1. A protective helmet comprising:

a shell including an inner wall which is contoured for mounting on the head of a person in protective relation thereto;

an impact absorbing material positioned within said shell in face-to-face abutting relation with said inner wall throughout at least a substantial portion of the surface thereof; and having an inner surface conforming to the head of the wearer

a shaped matrix having a plurality of individual pockets, each of which contains a heat exchange medium said matrix being located within a correspondingly formed recess in said impact absorbing material, and extending over an area coextensive with the major portion of the area of said surface of said impact absorbing material, said matrix being flexible to assume a shape conforming to that of said impact material, and

means for removably securing said matrix to said impact absorbing material.

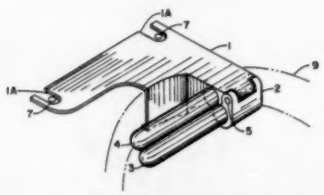
4,133,056

SOILED DIAPER WRINGER DEVICE

John M. Crump, Jr., 1018 Parkridge Cir., W., Jacksonville, Fla. 32211

Continuation of Ser. No. 618,133, Oct. 23, 1975, abandoned. This application Apr. 26, 1977, Ser. No. 790,965
Int. Cl.[2] D06F *45/22*
U.S. Cl. 4—1 **7 Claims**

1. In combination a wringer attachable to and disposable in a water closet and having a main mounting frame including a generally horizontal portion and a generally vertical portion, means for attaching said frame to a water closet bowl, a first elongated wringer element adjacent said vertical portion and having a longitudinal axis extending generally horizontally between one end and an opposite end which is mounted to said frame and disposable substantially beneath the rear portion of a water closet seat, a second elongated wringer element spaced from said vertical portion and having a longitudinal axis extending between one end and an opposite end and being parallel to said first element, the improvement comprising an auxiliary mounting frame, hinge means having an axis for mounting said auxiliary frame to said horizontal portion of said main frame inwardly of a water closet bowl, attachment means for connecting said opposite end of said second element to said auxiliary frame, said hinge axis and each of said longitudinal axes of said elements being spaced apart and parallel, said second element having its axis spaced below said axis of said first element to dispose said second element in an offset position with respect to said first element whereby said second element is located inwardly of a water closet bowl and substantially beneath the curved edge of a rear portion of a water closet seat, said hinge axis being located remotely above said axis of said second element and generally above said axis of said first element, said hinge axis being disposed offset from a plane defined between and including said longitudinal axes and spacedly away from the periphery of each of said elements whereby pivoting of said auxiliary frame and its attached said second element about said hinge axis moves said second element laterally of and generally upwardly away from said first element to define a generally uniform space between said elements for the ready longitudinal insertion of material to be wrung between said one end of said elements, and resilient means biasing said second element toward said first element for wringing out material therebetween.

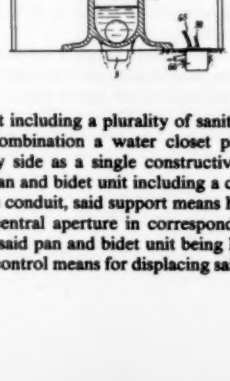


4,133,057

TOILET SET TO BE INSTALLED IN A MINIMUM SIZE ROOM

Stefano Rivetti, No. 31, Via Bertoloni, Rome, Italy

Filed Jul. 5, 1977, Ser. No. 812,592
Int. Cl.[2] A47K *4/00*; E03D *1/00*; A47K *3/20*
U.S. Cl. 4—1 **3 Claims**



1. A toilet unit including a plurality of sanitary fittings and comprising in combination a water closet pan and a bidet arranged side by side as a single constructive unit, support means for said pan and bidet unit including a common central siphon discharge conduit, said support means having an upper surface with a central aperture in correspondence with said central conduit, said pan and bidet unit being linearly slidable on said surface, control means for displacing said pan and bidet

respectively into the central position with respect to said discharge conduit, a seat cover covering said upper surface and having a central aperture in correspondence with said discharge conduit, said pan and bidet unit being slidable beneath said seat cover for selectively placing said water closet pan and bidet beneath said central aperture in the seat cover, a warm or cold water discharge box supported above said pan and bidet unit, first pipe means connecting said water box with said central discharge conduit adjacent outlets of pan and bidet unit, a plurality of water outlet holes arranged around said aperture in said seat cover, second pipe means connecting said water discharge box with said plurality of water outlet holes, third pipe means connected at one end to a hot air source and at the other end with a slot provided in said bidet, and a tiltable washing basin supported above said water box.

4,133,058

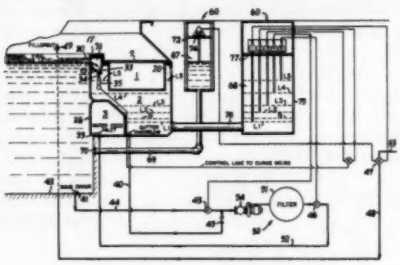
AUTOMATED POOL LEVEL AND SKIMMING GUTTER FLOW CONTROL SYSTEM

William H. Baker, 30 Honeysuckle Woods, Clover, S.C. 29710

Continuation-in-part of Ser. No. 663,161, Mar. 2, 1976, abandoned, which is a continuation-in-part of Ser. No. 640,825, Dec. 15, 1975, abandoned. This application Oct. 3, 1977, Ser. No. 838,700

Int. Cl.[2] E04H *3/16, 3/20*

U.S. Cl. 4—172.17 **60 Claims**



1. An automated water level and skimming flow perimeter gutter control system for swimming pools comprising, in combination, a gutter conduit for disposition about the perimeter of a swimming pool, receiving overflow across a top edge thereof and adapted to carry water at a level below a predetermined level in the swimming pool; a make-up valve which when open allows feed from a water make-up supply to proceed to the pool and when closed stops such feed; and at least two water level-responsive sensors in operative controlling relation to the valve, one of the two sensors sensing and directy responding to the level of water in the pool, the other of the two sensors sensing and directly responding to the level of overflow, one of said sensors opening the valve to allow feed from the water make-up supply to proceed to the pool whenever pool or overflow level falls below a predetermined level, and the other of the two said sensors closing the valve whenever pool or overflow level reaches a predetermined level, whereby only one of the sensors opens the make-up valve, and the other one of the sensors closes the make-up valve.

4,133,059

AUTOMATED SURGE WEIR AND RIM SKIMMING GUTTER FLOW CONTROL SYSTEM

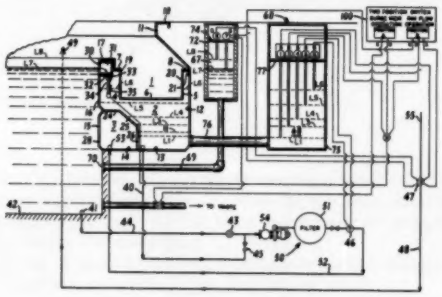
William H. Baker, 911 Rawlinson Rd., Rock Hill, S.C. 29730

Division of Ser. No. 663,161, Mar. 2, 1976, abandoned, which is a continuation-in-part of Ser. No. 640,825, Dec. 15, 1975, abandoned. This application Sep. 19, 1977, Ser. No. 834,584

Int. Cl.[2] E04H *3/16, 3/20*

U.S. Cl. 4—172.17 **7 Claims**

1. A pool perimeter skimming gutter water level control system comprising, in combination, a gutter conduit for disposition about the perimeter of a swimming pool, and adapted to carry water at a level below a predetermined level of water in the swimming pool; a retaining wall on the pool side of the gutter conduit, over the top rim of which wall water may flow from the pool into the gutter conduit; at least one surge weir disposed through the retaining wall below the top rim thereof, at a height to maintain a predetermined water level in the pool, and to provide a skimming flow of water through the weir at such predetermined water level in the pool, the top rim of the wall being spaced above the weir at a height to retain the pool water within the pool perimeter when the weir is closed at water flows, wave actions and surges up to a predetermined minimum, while allowing excessive flows, wave actions and



surges beyond such minimum to flow over the top of the wall into the gutter conduit; a weir closure movable between positions opening and closing the weir; a water cleaning and recirculating system for collecting water from the pool and water flowing into and along the gutter conduit, cleaning it, and returning it to the pool; an overflow sensor actuated when sensing a water level in the overflow downstream of the pool characteristic of a low threshold of pool activity, but excessive weir skimming flow, and arranged when actuated to close at least one weir closure; and means overriding the overflow sensor when not so actuated to close the weir closure and direct all skimming flow over the top rim of the retaining wall.

4,133,060

ODORLESS TOILET

Wayne Webb, 7531 Mountain Ave., Orangevale, Calif. 95662

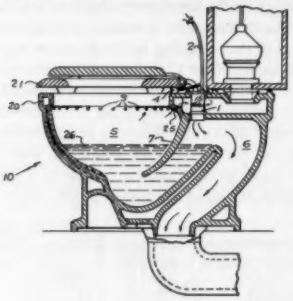
Filed May 18, 1977, Ser. No. 797,948

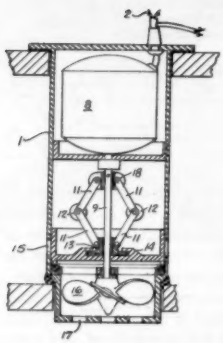
Int. Cl.[2] E03D *9/052;* **F04D** *25/14;* **G05D** *13/10*

U.S. Cl. 4—216 **2 Claims**

1. An odorless toilet comprising a toilet area, a sewer area, channel means connecting said toilet area to said sewer area, combined gate and vent means disposed in said channel means whereby when said gate and vent means are energized, ventilation is provided from said toilet area to said sewer area, and when said gate and vent means are deenergized, the channel means is closed; said vent means includes a fan contained in a housing, a shaft connected to said fan, a motor energized by a pressure sensitive switch connected to said shaft, and centrifugal weight means disposed upon said shaft attached to said gate means so that when said motor is energized, the centrifugal weights open said gate means providing ventilation; said toilet area is provided with plural orifices around the upper periphery thereof to provide the ventilation from outside of the toilet area to the inside; said centrifugal weights are disposed upon said shaft by a plurality of links which form a parallelogram; and wherein said gate means is connected to said links through a retaining member which has a disc-like bottom portion and a cylindrical top portion which overlies said shaft and wherein said gate means has a circular lip section which surrounds said disc-like bottom portion, and said lip section continues out-

wardly to define a circular bottom plate which has a cylindrical annulus portion surrounding said bottom plate to thereby





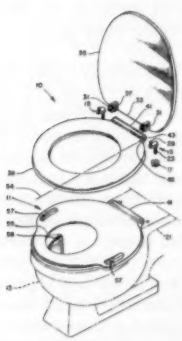
define said gate means and wherein said gate means is slideably disposed within said housing.

4,133,061

EASILY DISASSEMBLED HINGE ASSEMBLY

Everett C. Hurd, 12871 Barrett La., Santa Ana, Calif. 92705

Filed May 31, 1977, Ser. No. 802,217
Int. Cl.[2] A47K *13/12*
U.S. Cl. 4—236 **3 Claims**



1. A mechanically simplified hinge assembly for a toilet seat and cover comprising:

stationary hinge stanchion means having spherical ball extremities for pivotally supporting the toilet seat and cover;

depending spaced ears protruding from said cover and having juxtaposed concave, spherical indentations to accommodate and accurately position with a slight clearance a portion of said spherical ball extremities; and

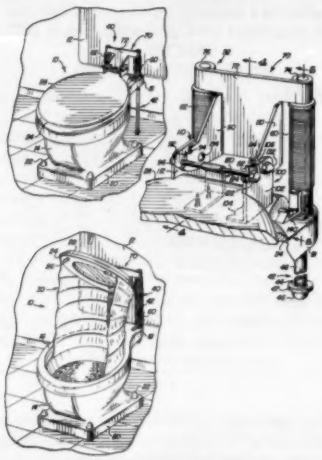
means on said toilet seat for both pivotally mounting said seat to said spherical ball extremities and providing quick and simple disengagement of said toilet seat comprising (i) oppositely facing concave, spherical indentations for accommodating other portions of said spherical ball extremities, and (ii) a relief groove having an access orthogonal to the plane of said seat and joining one of said concave, spherical indentations so that said seat is removed by merely tilting it about an axis in the plane of said seat and generally orthogonal to the pivot axis of said seat.

4,133,062

LIFTING APPARATUS FOR TOILET SEAT

Burley R. Fulbright, Jr., 8145 E. Elm Dr., Scottsdale, Ariz. 85257

Filed Feb. 7, 1978, Ser. No. 875,867
Int. Cl.[2] A47K *3/10, 17/00*; E03D *13/00*
U.S. Cl. 4—251 **19 Claims**



1. Lifting apparatus for a toilet seat, comprising, in combination:

a toilet having a bowl, a rim extending about the bowl, and a flange extending rearwardly from the rim;

first rod means secured to and movable through the flange of the toilet;

toilet seat means secured to the first rod means and pivotally movable relative to the first rod means and movable with first rod means between a down position and an up position;

spring means disposed between the flange of the toilet and the toilet seat means for biasing the toilet seat means and the first rod means to the up position;

lock means secured to the first rod means for locking the toilet seat means and the first rod means in the down position;

bracket means secured to the rod means and movable therewith;

flange means secured to the bracket means;

recess means on the flange means;

plate means secured to the toilet seat means and to the bracket means and including

slot means,

fastening means extending through the slot means and through the bracket means for securing together the plate means and the flange means; and

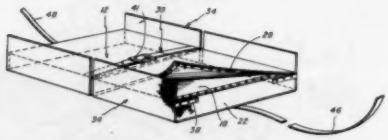
second rod means secured to the plate means and movable into the recess means to lock the toilet seat means relative to the bracket means and the flange means.

4,133,063

PORTABLE INFANT LAYETTE

Debbie Jones-Steele, 37 Winchester St., Boston, Mass. 02116

Filed Sep. 1, 1977, Ser. No. 829,634
Int. Cl.[2] A47D 7/00
U.S. Cl. 5—99 R 7 Claims



1. A portable mattress device comprising:

a pair of substantially rectangular mattress sections, each of the mattress sections having a top portion, a bottom portion, two sides and two ends, said mattress sections being hinged to each other along adjacent ends at the edges defined by the top portions and said adjacent ends of the mattress sections, to enable the mattress sections to be hinged toward and away from each other between a face-to-face configuration and a flat configuration;

side board means hingedly attached to the lower edges of the sides of at least one of the mattress sections, said side board means being hingeable to an upright configuration in which the side board means extends along the side of the mattress and substantially above the top of its associated mattress section, said side board means being of a length substantially equal to the combined length of the sides of the mattress sections when in a flat configuration thereby to define longitudinally extending side rails;

said side board means being of a height which is substantially double that of the thickness of one of the mattress sections; and

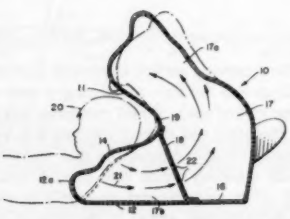
means for securing said side board means in said upright configuration.

4,133,064

INFLATABLE CHILD'S PILLOW

Victor Petrusek, 18511 Gottschalk St., Homewood, Ill. 60430

Filed Apr. 11, 1977, Ser. No. 786,107
Int. Cl.[2] A47G 9/00
U.S. Cl. 5—341 6 Claims



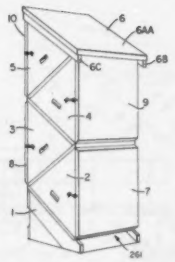
1. An air-inflatable pillow formed of deformable elastomeric sheet material shaped in the form of the head of an animal having upper and lower jaws spread apart to define an open mouth; said pillow providing an air-receiving chamber extending through said head and the upper and lower jaws thereof; means for inflating and deflating said pillow; said pillow including a bottom wall adapted to rest upon a supporting surface and forming the base of said lower jaw; said lower jaw upon inflation providing a resilient support for a child's head; and said open mouth being dimensioned to accommodate the child's head when the same is supported on said resilient lower jaw.

4,133,065

MODULAR BEEHIVE CONSTRUCTION AND COMPONENT THEREFOR

John A. Hogg, 2225 S. 36th St., Kalamazoo, Mich. 49053

Filed Oct. 15, 1976, Ser. No. 733,011
Int. Cl.[2] A01K 47/00
U.S. Cl. 6—1 18 Claims



1. A stackable module, for a beehive construction of the kind having a support and means for covering a module supported by said support, said module being substantially of triangular prism shape and comprising:

a pair of spaced, opposed, substantially parallel triangular end members defining the ends of said prism;

a panel connecting said triangular end members and defining a first face of said prism, said panel being perforated for entry of hive occupants into said module, said perforated panel having opposite first and second edges adjacent said triangular end members;

a removable door panel defining a second face of said prism, said module being open at the third face of said prism;

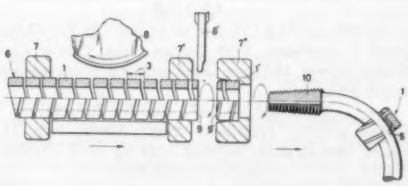
whereby ones of said modules are stackable to form a beehive construction, with the open face of one facing said perforated panel of the next and a said perforated panel disposed between said support and cover means and accessible to bees from outside the hive, and with said door panels exposed for ready human access into said modules.

4,133,066

METHOD FOR MANUFACTURING SELF-LOCKING SPRING NUT

Minoru Kamiya, 2-46-3, Minami-Otsuka, Toshima, Tokyo, Japan

Filed Jun. 6, 1977, Ser. No. 803,531
Int. Cl.[2] B21D 53/24
U.S. Cl. 10—86 A 15 Claims



1. A method of manufacturing a self-locking spring nut, comprising the steps of:

providing a piece of a helical spring material of a single nut size;

holding said piece, with at least a portion of the piece being free;

rotating said piece;

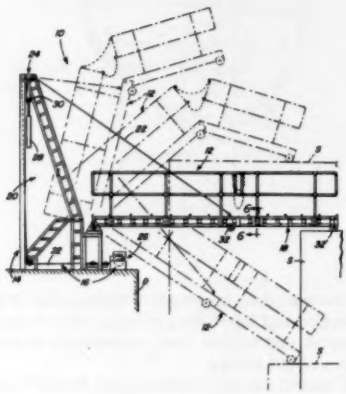
inserting a tap into the axial hole defined by said piece so as to tap said piece to form a female screw thread in the wall of said hole by utilizing the thrust of said tap.

4,133,067

ARTICULATING GANGWAY

Ronald W. Bennett, and Herbert H. Williams, both of P.O. Box 5329, Florence, S.C. 29501

Filed Dec. 16, 1977, Ser. No. 861,557
Int. Cl.[2] E01D 1/00
U.S. Cl. 14—71.3 8 Claims



1. A walkway, comprising, in combination:
(a) an elongated member forming a passageway;
(b) base means connected to the elongated member for pivotally supporting the elongated member for movement about a substantially horizontal axis and permitting the member to swing in a substantially vertical path; and
(c) position control means connected to the member for controlling swinging movement of the member, the position control means including, in combination:
(3) weight;
(4) a winch; and
(5) cable means connected to the elongated member and to the winch and arranged supporting the weight between the member and winch, the weight taking-up slack in the cable means during an upward movement of the member about the horizontal pivot axis thereof, while being selected to have less weight than the member and permitting the cable means to be let-out during a downward movement of the member about the horizontal pivot axis thereof, with the winch being arranged for swinging the member upwardly against the mass of the member in order to move the member toward the substantially vertical storage position thereof.

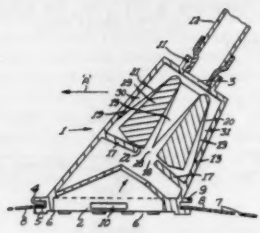
4,133,068

CLEANING APPARATUS FOR SUBMERGED SURFACES

Helmut J. Hofmann, 1310 Golden Oaks, Corner Claim and Yettah Streets, Hillbrow, Johannesburg, Transvaal Province, South Africa

Filed Aug. 23, 1977, Ser. No. 827,185
Claims priority, application South Africa, Aug. 23, 1976, 76/5024; Nov. 8, 1976, 76/6672; May 30, 1977, 77/3262
Int. Cl.[2] E04H 3/20
U.S. Cl. 15—1.7 6 Claims

1. Apparatus for cleaning submerged surfaces comprising:
a balanced operating head having an inlet and an outlet defining respective inlet and outlet axes,
the outlet adapted to be swivelably connected to a longitudinally resilient and flexible suction hose,
the inlet axis being inclined at an angle of between thirty degrees and sixty degrees to that of the outlet axis,
a pair of passages through the head from inlet to outlet,
an oscillatable valve in the head adapted to alternately close said passages,
a baffle plate in the head between the inlet and valve to cause one of the passages to be more restricted and less direct between inlet and outlet then the other and



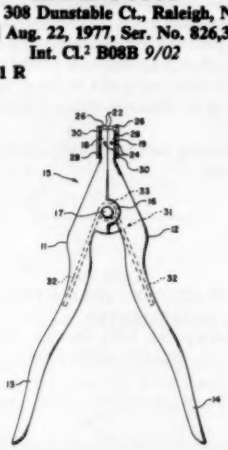
the valve shaped so that liquid flow through the passages will cause automatic oscillation thereof between terminal positions in each of which one of the passages through the head is closed.

4,133,069

REAMING TOOL

Nathan Sunshine, 308 Dunstable Ct., Raleigh, N.C. 27604

Filed Aug. 22, 1977, Ser. No. 826,398
Int. Cl.[2] B08B 9/02
U.S. Cl. 15—104.1 R 3 Claims



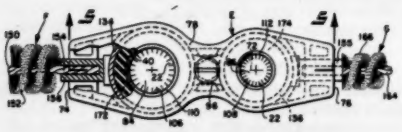
1. A tool for removing surface impurities from the interior of pipes, couplings and the like comprising: a pair of elongated members; one end of each of said members forming a handle portion and the other end thereof forming a scrapper support portion; means pivotably connecting said members intermediate their ends whereby when said handle ends are moved toward each other said support ends will move away from each other; and scrapper means in the form of an elongated, generally flat, T-shaped in cross section blade with the outer corners of the cross portion of the T acting as cutting edges with the intermediate area between such edges being adapted to accept scrape accumulations without interfering with the operation of the tool, and the shaft portion of each of said T-shaped scrapper means being pivotably inserted into a slot in each of said support ends whereby said scrappers can be inserted into the interior of a pipe or the like and expanded to come into firm self-leveling scrapping contact with the interior of such pipe by squeezing the handle portions toward each other and with a twisting motion said interior can be cleared of impurities.

4,133,070

SCARIFYING TOOL FOR PIPE ENDS

Sanford Litt, 27050 Cedar Rd., Beechwood, Ohio 44122

Continuation-in-part of Ser. No. 670,346, Mar. 25, 1976, Pat. No. 4,038,715. This application Jun. 2, 1977, Ser. No. 802,779
Int. Cl.[2] A46B 3/18, 7/00
U.S. Cl. 15—106 13 Claims



1. A hand held scarifying tool comprising: a substantially rigid body member having a longitudinal axis, opposite outer surfaces and opposite ends, said body member being formed by a pair of separable parts separably joined together generally parallel to said axis and defining a cover part and a holder part, scarifying devices having mounting means trapped between said parts against axial and rotational movement in outwardly extending relationship to said opposite ends, cooperating aligned openings in said parts defining a hole through said body member across said outer surfaces, said hole having a peripheral surface, said holder part having a cylindrical projection spaced outwardly from said opening therein and extending past said longitudinal axis of said body member toward said cover part, said projection having an inner surface defining said peripheral surface of said hole, said cover part having a generally cylindrical cavity closely receiving at least a portion of said projection, and scarifying material lining said peripheral surface.

4,133,071

WINDSHIELD WIPER ARM

Robert F. Jaske, Michigan City, Ind., assignor to Sprague Devices, Inc., Michigan City, Ind.

Filed Nov. 8, 1976, Ser. No. 739,983
Int. Cl.[2] B60S 1/46, 1/52
U.S. Cl. 15—250.04 3 Claims

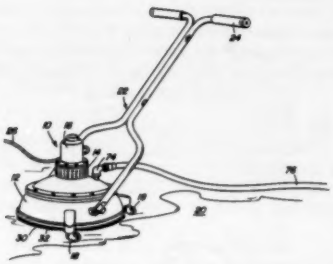
3. In combination,
an elongated windshield wiper arm including a tubular portion intermediate its ends and channel shaped end portions,
means mounting said arm at one channel portion thereof to swing alongside a vehicle windshield,
means urging said arm toward said windshield and including a coil spring anchored at its ends to said mounting means and to and within one channel arm portion,
a spray nozzle carried by and having a part located within the channel portion at the free end of the arm, and
a flexible tube extending through the tubular arm portion and said coil spring and connected to the part of the nozzle located within the free end arm channel,
said arm mounting means including a rock shaft and a head detachedly mounted on said shaft by securing means, said head having at least one set of opposite substantially parallel and flat tool accommodating surfaces.

4,133,072

DEVICE FOR REMOVING WATER FROM LARGE FLOOR SURFACES

Samuel A. Face, Jr., P.O. Box 6341, Norfolk, Va. 23508

Filed Mar. 1, 1977, Ser. No. 773,150
Int. Cl.[2] A47L 5/34
U.S. Cl. 15—353 11 Claims



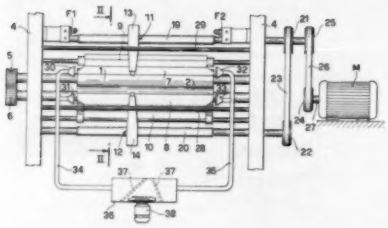
1. Floor drying apparatus, comprising:
a shell defining a plenum chamber within a lowermost portion thereof;
means carried on the shell for drawing a vacuum within the plenum chamber;
nozzle means for communicating the plenum chamber to ambient surroundings, said nozzle means being carried on the shell at a lowermost portion thereof and being spaced from the surface of a floor to be dried for withdrawal of stream of liquid and gas from said floor, the stream being directed into the plenum chamber;
means for seaparating the liquid from the gas in said stream, the liquid collecting temporarily in the plenum chamber and the gas being withdrawn from the apparatus by the vacuum drawing means;
liquid pump means disposed in a lower portion of the plenum chamber for discharging the liquid in the plenum chamber from the apparatus;
a single prime mover for driving both the vacuum drawing means and the liquid pump means;
resilient squeegee means mounted adjacent to the nozzle means for increasing flow of the stream of liquid and gas into the nozzle means, the nozzle means forming an annular opening in a lower portion of the shell, the squeegee means further comprising an annular body of resilient material attached at its upper end about the inner periphery of said opening, the annular body extending downwardly from the opening to contact the floor along the lower edge of the annular body; and
wherein the shell comprises a lower wall member which forms the lower wall of the plenum chamber, the apparatus further comprising an annular boss member disposed within the shell and having an arcuate wall portion, an upper plate member centrally disposed between the arcuate wall portion of the boss member and partially defining the plenum chamber, the boss member and the lower wall plate member substantially defining the plenum chamber, the nozzle means directing the stream into the plenum chamber along the arcuate wall portion of the annular boss member, the direction of movement of the stream thereby being altered by the curve of the arcuate wall portion to produce laminar characteristics in the stream, the heavier liquid being disentrained from the gas flow and falling to the bottom of the plenum chamber.

4,133,073

CLEANING DEVICE FOR THE SCRAPER BLADES ASSOCIATED WITH ROTATING SEPARATION AND/OR CLEARING ROLLERS FOR A TEXTILE FIBRE WEB IN SPINNING MACHINES

Angelo Marzoli, Bergamo, Italy, assignor to F.lli Marzoli & C. S.p.A., Brescia, Italy

Filed Apr. 11, 1977, Ser. No. 786,676
Claims priority, application Italy, Apr. 14, 1976, 22323 A/76
Int. Cl.[2] D01H *11/00*
U.S. Cl. 15—308 5 Claims



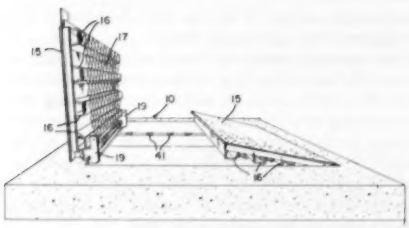
1. A cleaning device for the scraper blades associated with rotating separation and/or clearing rollers for a web in a spinning machine, such as a card or the like, comprising for each blade a cleaning element resting on the blade, control means to cause each of said cleaning elements to continuously reciprocate from one end of its respective blade to the other, said cleaning elements being in sliding contact with the blades over their entire length, and suction means for cleaning said cleaning element being disposed in spaced relation to the ends of said rollers and said blades.

4,133,074

SPRING ASSISTED DOOR CONSTRUCTION

John B. Schack, Box 588, Auburn, Wash. 98002

Filed Aug. 3, 1977, Ser. No. 821,535
Int. Cl.[2] E05F *1/12*
U.S. Cl. 16—180 10 Claims



1. A counterbalance hinge construction for assisting the opening of heavy access doors covering an opening comprising:

a frame member along one side of the opening,

a door having a lowered position closing the opening, a fully open position, and a intermediate position between the lowered and fully open positions,

hinge member means pivotally connected to the frame member to pivot and move with the door from the lowered position within the opening to a stationary position corresponding to the intermediate position of the door, the hinge member means also being pivotally connected to the door so that the door may be pivoted about the stationary hinge member means from the intermediate position to the fully open position while the hinge member means remains stationary,

first counterbalance spring means arranged to be loaded when the door is swung down to a closed position from its intermediate position, and

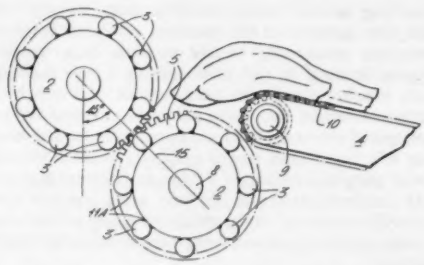
second counterbalance spring means arranged to be loaded when the door is swung down to its fully open position from its intermediate position.

4,133,075

MEAT TENDERIZING APPARATUS

Paul D. Collins, Haverhill, England, assignor to Haverhill Meat Products Limited, Suffolk, England

Filed Aug. 8, 1977, Ser. No. 822,758
Claims priority, application United Kingdom, Aug. 11, 1976, 33433/76
Int. Cl.[2] A22C *9/00*
U.S. Cl. 17—26 9 Claims



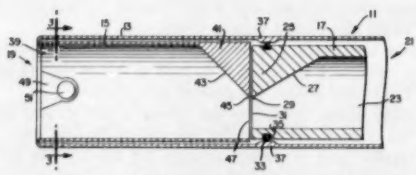
1. A meat tenderising apparatus comprising a frame, a pair of rollers mounted in the frame with their rotational axes disposed in substantially parallel planes, a plurality of generally axially-directed ribs having rounded outer contours disposed on the outer surface of each of said rollers, drive means operable to rotate the rollers in opposite directions, and conveyor means terminating adjacent the nip between the rollers for feeding meat into said nip, the rollers being positioned in the frame and the drive means being arranged such that at said nip, the ribs of one roller are aligned with the gaps between the ribs of the other rollers substantially without intermeshing occurring between the ribs and gaps so that tenderising of the meat is effected without crushing as it passes between the rollers.

4,133,076

LARGE CASINGS STUFFING PRODUCT STOPPERING MEANS

Vytautas Kupcikevicius, Chicago, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jun. 30, 1977, Ser. No. 812,023
Int. Cl.[2] A22C *11/02*
U.S. Cl. 17—41 3 Claims



1. In apparatus for encasing viscous fluid product in continuous lengths of flexible tubular casing by forceably conveying such product through a stuffing horn assembly having an inlet end connecting to a product supply source and a discharge end from which such product passes into such casing, the improve-

ment of a product flow control apparatus assembly which comprises, in combination;

first sleeve means axially aligned with and disposed internally of the stuffing horn assembly, having an open end disposed towards the inlet end of the stuffing horn assembly and an orificed outlet end disposed towards the discharge end of the stuffing horn assembly;

second sleeve means axially aligned with and disposed interiorly of the stuffing horn assembly, having an open end disposed towards the discharge end of the stuffing horn assembly and an orificed inlet end disposed towards the inlet end of the stuffing horn assembly;

and control means operable exteriorly of the stuffing horn assembly to selectively relatively move the orificed outlet end of the first sleeve means and the orificed inlet end of the second sleeve means into and between product flow and product cutoff positions.

4,133,077

METHOD FOR OBTAINING OF MEAT FROM MARINE CRUSTACEA, ESPECIALLY FROM ANTARCTIC KRILL

Zbigniew Jaśniewicz, Gdansk-Oliwa; Jan Knyszewski, Gdynia; Tadeusz Ośrodek, Gdansk-Oliwa, and Lech Stefański, Gdynia, all of Poland, assignors to Prezedsiebiorstwo Polowow Dalekomorskich i Uslug Rybackich "Dalmor", Gdynia, Poland

Filed Sep. 7, 1977, Ser. No. 831,260
Claims priority, application Poland, Sep. 14, 1976, 192426
Int. Cl.² A22C *29/00*
U.S. Cl. 17—48 **5 Claims**

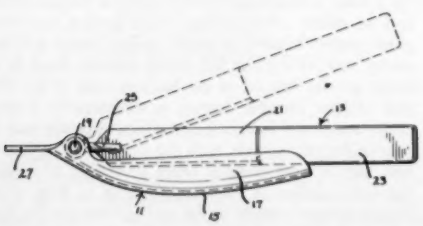
1. A method for obtaining meat from the abdominal section of Antarctic krill, comprising the sequential steps of cooking the krill in water or steam at a temperature in the range of 70–150° C., cooling the cooked krill in a water bath having a salinity not higher than 4 percent at ambient temperature, imparting to the krill an acceleration to a value of 5–1500 g in a closed system containing a plurality of sharp-edged elements provided on its working surface to initiate destruction of the chitine shell of the krill, subjecting the accelerated krill to sudden deceleration by means of mechanical ob-stacles introduced across the path of the accelerated krill in order to separate the animal abdomen from the cephalothorax and to extract edible meat from the abdominal section of the krill by fragmentation introducing the krill fragments into an aqueous bath whereby the edible meat settles to the bottom of the bath and the non-edible fragments float in a layer on the surface of the bath, separating the non-edible fragments from the bath and re-moving the edible meat from the bath.

4,133,078

BIVALVE OPENER

Kenneth C. Cromwell, 155 Charlesgate Cir., E. Amherst, N.Y. 14051

Filed Dec. 6, 1976, Ser. No. 748,149
Int. Cl.² A47G *21/06*
U.S. Cl. 17—75 **3 Claims**



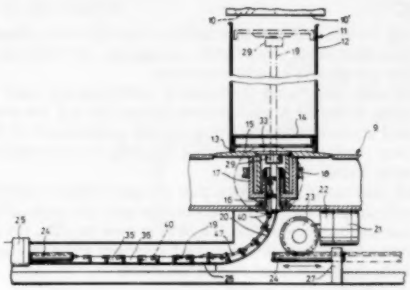
1. An opener for bivalves which comprises: a body and a knife carried by said body; said body having a pair of parallel spaced upstanding ears and a channelled portion extending longitudinally from said ears for a major portion of the length of said body, said channelled portion having sides which are generally parallel and curved upwardly and a closed bottom which is curved longitudinally whereby to be easily and conveniently gripped by the hand of a user and serve to hold a bivalve on edge; said knife being adapted to separate the shells of a bivalve thus held and being pivotally carried at one end thereof on said ears for movement in a vertical arc and also for rotation about its longitudinal axis; said body also having a spatula-like, flat portion extending longitudinally from said ears opposite said channelled portion, said spatula-like portion being substantially in a plane normal to the planes of said ears, having no sharp edges, and having a rounded face end; and said channelled portion further being adapted to enclose the major portions of the edges of said knife when the latter is so rotated that the blade thereof is parallel to said spatula-like portion.

4,133,079

CANISTER ROTATION MECHANISM

Kurt Kriechbaum; Herbert Walter, both of Ebersbach; Herbert König, Ebersbach-Sulpach, and Max Hartmannsgruber, Kirchheim, all of Germany, assignors to Zinser Textilmaschinen G.m.b.H., Ebersbach, Germany

Filed Jun. 9, 1977, Ser. No. 805,214
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1976, 2626011
Int. Cl.² B65H *54/80*
U.S. Cl. 19—159 R **6 Claims**



1. For use in connection with a carding machine, drawing frame or the like, a cannister handling mechanism for sliver collection comprising:

a frame;

an annular turntable rotatably mounted on said frame for supporting a cannister having a movable bottom thereon;

means for rotating said turntable;

a trackway having a first portion extending horizontally beneath said frame and a second portion curving upwardly and terminating in a vertical portion in said frame below and concentric with said turntable;

elongate means flexible in at least one plane supported on said trackway; and

horizontally reciprocable drive means connected to said flexible means at a point remote from the vertical portion of said trackway for positioning the opposite end of said flexible means in engagement with the underside of said movable cannister bottom to position said bottom at any desired height therewithin.

4,133,080

TEXTBOOK HOLDER

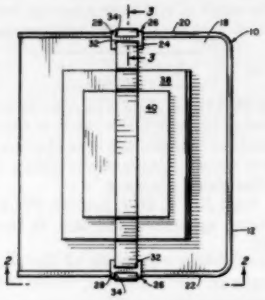
John Kuk, 1419 Calle Durazno, Thousand Oaks, Calif. 91306

Filed Nov. 4, 1974, Ser. No. 520,724
Int. Cl.² A45F *5/12*
U.S. Cl. 24—73 HH **1 Claim**

1. In combination with the notebook, said notebook having

a hard cover binder, said notebook having a peripheral edge, said notebook being adapted to retain a plurality of leaves of papers, a holding device for securely retaining at least one textbook upon said notebook, said holding device comprising:

a first clasp and a second clasp with a stretchable strap located therebetween, said first clasp to be in engagement with one edge of the periphery of said notebook with said second clasp being in engagement with an opposite edge of the periphery of said notebook causing said stretchable strap to be just slightly stretched therebetween, whereby said stretchable strap can be manually stretched to a displaced position above the top surface of said notebook permitting location of at least one textbook between said



top surface and said stretchable strap and when released, said stretchable strap tightly presses the textbook against the top surface of said notebook;

each said clasp being U-shaped in configuration, each said clasp including a section bent over on its self one end of said stretchable strap being tightly compressed by bent over section thereby affecting securing of said stretchable strap to said clasp, and

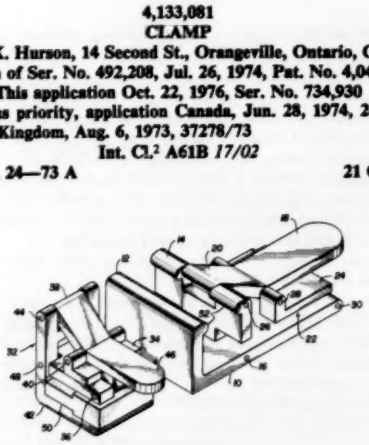
each said clasp including a pair of spaced apart openings, said strap being conducted through said openings prior to coming into contact with said bent over section, the portion of said strap between said openings to be in contact with the top surface of said notebook.

4,133,081

CLAMP

James K. Hurson, 14 Second St., Orangeville, Ontario, Canada

Division of Ser. No. 492,208, Jul. 26, 1974, Pat. No. 4,048,987.
This application Oct. 22, 1976, Ser. No. 734,930
Claims priority, application Canada, Jun. 28, 1974, 203740; United Kingdom, Aug. 6, 1973, 37278/73
Int. Cl.[2] A61B 17/02
U.S. Cl. 24—73 A 21 Claims



1. A clamp comprising:

(a) a base (10);

(b) a jaw (12) fixedly mounted on said base (10) and extending upwardly therefrom;

(c) an opposing jaw (14) spaced along said base (10) from said fixed jaw (12) and in clamping relation to said fixed jaw (12) when said clamp is in its closed position, said opposing jaw (14) being pivotally mounted (16) at one end to said base (10); and

(d) clamp opening and closing means for moving said opposing jaw (14) into and out of clamping relation to said fixed jaw (12) by pivoting and opposing jaw (14) on said opposing jaw's base pivot mounting (16), said means comprising:

(i) a first elongated member (24) pivotally mounted (30) at a first end remote from said jaws (12 and 14) on said base (10) and free of said base at its second end proximate to said jaws, said first elongated member (24) being parallel to said base (10) when said jaws are in the closed position;

(ii) a lever (18) pivotally mounted (28) on said first member (24) at said second end of said first member (24); and

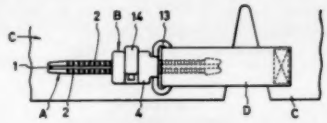
(iii) a second elongated member (20) extending from said lever's pivot (28) at said second end of said first elongated member (24) angularly to the end of said opposing jaw (14) remote from said base (10) whereat said second elongated member (20) is pivotally connected (26) to said opposing jaw (14), whereby said opposing jaw (14) can be pivoted out of clamping relationship with said fixed jaw (12) by actuation of said lever (18) resulting in over-center motion of the pivot point (18) of said lever (18) at said second end of said first elongated member (24).

4,133,082

ADJUSTABLE FASTENING DEVICE

Yoshihiro Kanzaka, Nyuzen, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Mar. 23, 1978, Ser. No. 889,400
Claims priority, application Japan, Apr. 5, 1977, 52-42163[U]
Int. Cl.[2] A44B 21/00
U.S. Cl. 24—206 R 12 Claims



1. An adjustable fastening device, which comprises:

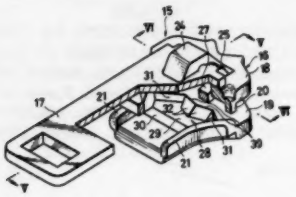
(a) an adjustment belt including rows of teeth arranged on the front face thereof perpendicularly thereto and legs projected from the back face of the adjustment belt, and

(b) a slider comprising a body portion, a stopper member and an elastic member; said body portion including a guide groove adapted to guide the adjustment belt therealong, said adjustment belt being slidably fitted in said guide groove formed on the body portion of the slider, said stopper member having a substantially U-shaped cross-section and including claws formed on the back face thereof for engagement with the teeth of the adjustment belt, said stopper member being clippingly mounted on the body portion in such a manner as to slide relative thereto perpendicularly to the guide groove for the adjustment belt within a limited region to prevent said stopper member from escaping out of the body portion, and said stopper member being urged by said elastic member in a direction pulling the stopper member out of the body portion of the slider.

4,133,083
LOCK SLIDER FOR SLIDE FASTENERS

Koichi Watanabe, Kurobe, and Ichiro Terasaki, Uozu, both of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Mar. 2, 1978, Ser. No. 882,920
Claims priority, application Japan, Mar. 14, 1977, 52/30531[U]
Int. Cl.[2] A44B *19/30*
U.S. Cl. 24—205.14 A 2 Claims

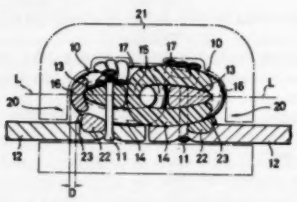


1. A lock slider which can be locked against movement in a desired position on rows of interlocking fastener elements, comprising a slider body having top and bottom wings connected at their front ends so as to provide therebetween a guide channel for the fastener elements, the top wing of the slider body having at least one opening formed therein, a pull tab pivotally connected at one end to the top wing of the slider body, and locking means on said one end of the pull tab capable of intruding into the guide channel through the opening in the top wing of the slider body for pressing the fastener elements therein against the bottom wing of the slider body and hence for locking the slider against movement when the pull tab is turned to a recumbent position on the slider body, the bottom wing of the slider body having formed in its inside surface a depression for partly receiving the fastener elements pressed by the locking means, the depression being bounded at its front end by a pair of forwardly converging walls and a pair of rearwardly converging walls disposed between the forwardly converging walls and each inclined forwardly with respect to the plane of the bottom wing of the slider body.

4,133,084
SLIDE FASTENER WITH CONTINUOUS COUPLING ELEMENTS

Hiroshi Yoshida, Uozu, Japan, assignor to Yoshida Kogo K.K., Tokyo, Japan

Filed Oct. 5, 1977, Ser. No. 839,437
Claims priority, application Japan, Oct. 12, 1976, 51-136870[U]
Int. Cl.[2] A44B *19/04*
U.S. Cl. 24—205.16 C 4 Claims

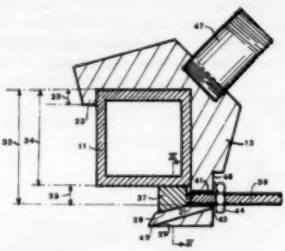


1. A slide fastener stringer for combined use with another stringer of identical construction, comprising a support tape, a leveling cord formed substantially integral with the support tape and extending longitudinally thereof, the leveling cord being located in the adjacency of a longitudinal edge of the support tape and being at least partly raised from one of the surfaces thereof, a continuous coupling element lying on one said surface of the support tape and extending along said longitudinal edge thereof, the continuous coupling element being in the form of a coil of synthetic-resin material with the turns thereof being substantially oval-shaped and having a row of coupling heads for mating interengagement with corresponding coupling heads of the other stringer and bight portions serving to connect the turns of the coil and pairs of upper and lower shanks extending between the coupling heads and the bight portions, the lower shanks of the coupling element resting on the leveling cord at their regions in the adjacency of the bight portions whereby a notional line extending between the mid point of each coupling head and the mid point of the corresponding bight portion is oriented substantially parallel to the plane of the support tape, and securing means including a row of stitches extending along the coupling element for securing same to the support tape, said securing means further including a core extending through the interior of the coil and disposed in contact with the bight portions thereof, the row of stitches passing through the core, and the row of stitches passing through the support tape on the same side of the leveling cord as said longitudinal edge of the support tape and being held in contact with the leveling cord.

4,133,085
CONNECTING CLAMP

Erik G. Hansson, Sandbem, Sweden, assignor to Svenska Kram AB, Falkoping, Sweden

Filed Aug. 30, 1977, Ser. No. 829,065
Claims priority, application Sweden, Aug. 30, 1976, 7609581
Int. Cl.[2] A44B *21/00*
U.S. Cl. 24—263 SW 11 Claims



1. A clamp adapted for attachment to a longish body having four parallel right-angled outer corners, comprising a yoke having a gap for partly embracing said body, two planar inner faces at right angles to each forming part of said gap and meeting at a first inner corner, a first jaw integral with said yoke extending from one of said planar inner faces at a right angle to form a second inner corner adapted for close engagement with one outer corner of said body, a second jaw integral with said yoke extending at an obtuse angle from the other of said planar inner faces to form a third inner corner, the distance of said third inner corner from said first inner corner being greater than the distance of said second inner corner from said first inner corner, a member slidingly displaceable along said second jaw for engagement with an outer corner of said body situated diagonally to said first inner corner, and a bolt connected to said member and extending through said yoke for wedging said member into the space between said second jaw and a corresponding outer corner of said body for securing the clamp thereto.

4,133,086
PNEUMATIC SPRINGING SHOE

John L. Brennan, 11000 Westwood Lake Dr., Miami, Fla. 33165

Filed Mar. 23, 1977, Ser. No. 780,528
Int. Cl.[2] A43B *3/10*
U.S. Cl. 36—7.8 7 Claims

1. A pneumatic springing-shoe comprising a foot supporting plate, a ground engaging plate, a pair of pneumatic springing

means, fastening means constructed and arranged to fixedly secure said pneumatic springing means substantially vertically between said foot supporting plate and said ground engaging

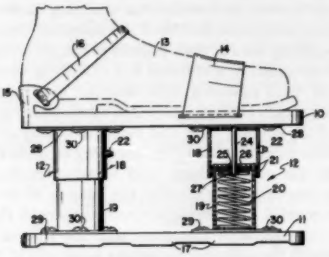


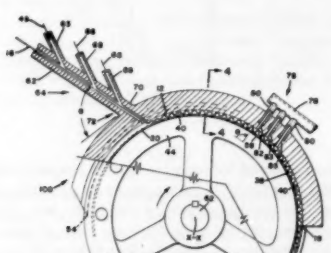
plate adjacent the forward and rear ends thereof respectively, and a valve associated with each of said pneumatic springing means for varying the resiliency thereof.

4,133,087

METHOD AND APPARATUS FOR TEXTURIZING CONTINUOUS FILAMENTS

Hsin L. Li, Parsippany; Hendrikus J. Oswald, Morristown, and Alfred L. Liland, Lake Shawnee, all of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 619,085, Oct. 2, 1975, Pat. No. 4,024,611. This application May 20, 1977, Ser. No. 799,066
The portion of the term of this patent subsequent to May 24, 1994, has been disclaimed.
Int. Cl.[2] D02G *1/20, 1/16, 1/12*
U.S. Cl. 28—257 **25 Claims**



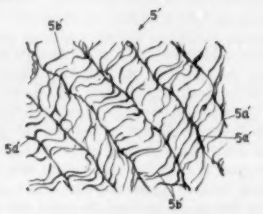
1. Apparatus for crimping continuous filaments comprising:
(a) a chamber having an inlet opening for receiving the filaments and an outlet opening for withdrawing the filaments;
(b) barrier means disposed in said chamber adjacent said inlet opening;
(c) fluid directing means for directing a stream of compressible fluid containing said filaments into contact with said barrier means to initiate crimping thereof;
(d) fluid escape means associated with said chamber for separating the major portion of said fluid from said filaments and expelling it from said chamber;
(e) carrier means for transporting said filaments through said chamber, including a continuously moving surface associated with said chamber to cause overfeeding of said filaments into said chamber, said filaments being forced against a mass thereof within said chamber to produce crimps therein;
(f) heating means connected to and upstream of said fluid directing means for contacting said filaments with heated fluid to increase the temperature of the filaments; and
(g) crimp setting means, including fluid jet heating means disposed in said chamber downstream of said fluid directing means, for contacting said mass of filaments with at least a second stream of heated fluid to set the crimps, whereby said filaments emerge from the chamber in crimped form.

4,133,088

ROOM TEMPERATURE CRIMPING OF FIBRILLATED FILM MATERIAL

Kokichi Hikobe, and Kyoichi Hikobe, both of 1-873 6 chome Hirosawa-cho, Kiryu-shi, Gunma-ken, Japan

Filed Jun. 7, 1977, Ser. No. 804,274
Claims priority, application Japan, Jun. 10, 1976, 51-68063
Int. Cl.[2] D02G *1/14, 3/22*
U.S. Cl. 28—279 **6 Claims**



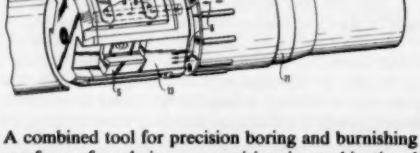
1. A method of producing a crimp-finished yarn comprising passing a mesh-like fiber structure formed from a thermoplastic film between a pair of opposed rollers, said fiber structure having longitudinally extending relatively thick filaments and transversely extending relatively thin filaments, one of said rollers being formed with teeth on its periphery and the other of the rollers being smooth and constituted as a friction roller, providing relative rotation between said rollers such that the roller with teeth has a relative peripheral velocity with respect to the surface of the friction roller, said fiber structure being passed through said rollers at room temperature and being engaged by the roller with teeth at one surface thereof and subjected to the advancing action thereof due to the rotation of said roller while the opposite surface of the fiber structure is subjected to a resisting force due to the engagement thereof with the friction roller such that the differential action of the rollers produces differential layer conditions in the fiber structure concurrently with the formation of saw-tooth crimps in said fiber structure at room temperature.

4,133,089

COMBINED PRECISION BORING AND BURNISHING TOOL

Lothar Heymanns, Mönchen-Gladbach, Fed. Rep. of Germany, assignor to Wilhelm Hegenscheidt GmbH, Erkelenz, Fed. Rep. of Germany

Filed Nov. 16, 1977, Ser. No. 837,690
Int. Cl.[2] B24B *39/00*; B23B *51/06*
U.S. Cl. 29—90 R **12 Claims**



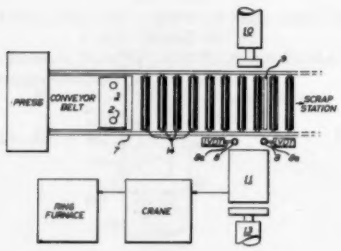
1. A combined tool for precision boring and burnishing the inner surfaces of workpieces comprising, in combination, bore head means; burnishing means arranged rearwardly of said

bore head means and adapted to be advanced in axial direction into a workpiece for finishing the internal surface of the latter while a stream of flushing oil under pressure is fed preferably in the direction of advancement of the tool about the same for removing chips shaved off by the bore head means; and means for hydraulically guiding said bore head means, including a plurality of circumferentially displaced oil pockets and means for supplying oil under pressure to said pockets, including oil feed bores and throttle bores between said feed bores and said oil pockets.

4,133,090
CONTROL OF BINDER CONTENT IN CARBON ARTICLE MANUFACTURE

Richard W. Peterson, Lower Burrell, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Jun. 15, 1977, Ser. No. 806,715
Int. Cl.[2] H01J *9/00*
U.S. Cl. 29—25.18 **1 Claim**



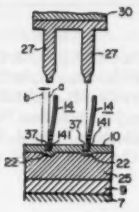
1. A method of preparing carbon articles comprising the steps of mixing binder and carbon aggregate, forming the resulting mixture into an article, measuring the slump of the article at least to hundredths of an inch following the forming and prior to baking, and, if necessary, changing the relative proportions of binder and carbon aggregate in subsequent executions of the mixing step to yield a target amount of slump.

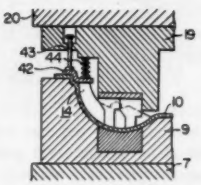
4,133,091
APPARATUS FOR FIXING BLADES ON TURBINE WHEEL FOR FLUID COUPLING MADE OF SHEET METAL

Hiroshi Ito, Kawagoe, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Japan

Filed Apr. 11, 1977, Ser. No. 786,143
Claims priority, application Japan, Apr. 12, 1976, 51-41142
Int. Cl.[2] B23P *19/04, 23/00, 11/00*
U.S. Cl. 29—33 K **2 Claims**

1. An apparatus for fixing a plurality of blades onto the inner concaved surface of an outer shell with an axial center line of a turbine wheel for a fluid coupling made of sheet metal, comprising in combination: a die section having a recess to hold therein the inner concaved surface of the outer shell with the same being upwardly directed and having a plurality of concaved molds formed at an equal space interval therebetween and in ring form; a punch section having a plurality of punches in ring form to oppose said plurality of concave molds in said die section in a vertically movable manner and being orientated in a first position for forming slots in the inner concaved surface of the outer shell; and a blade keeping plate movable with said ring-shaped punches, wherein said concaved molds in said die section are formed in three concentric rings of the innermost, the intermediate, and the outermost or peripheral, said plurality of punches in array are made to oppose said respective rings of said concaved molds, said concaved mold and punches in each of the concentric rings are arranged mutually in parallel, wherein said punches are movable in a second position so that said blades as fitted in said concaved molds are staked at one side thereof along the radially extending longitudinal direction thereof from the axial center line, and each of



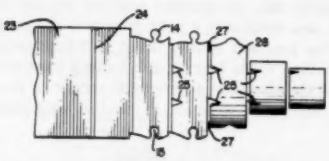


said punches is notched at its outer tip end corner to the inner concaved surface of said outer shell.

4,133,092
METHOD OF MAKING SHAFT SEAL WITH CLINCH-BUTT METAL CASE

Samuel E. MacArthur, Lathrup Village, and Stanley N. Smith, Farmington, both of Mich., assignors to Federal-Mogul Corporation, Detroit, Mich.

Division of Ser. No. 673,577, Apr. 5, 1976, Pat. No. 4,052,077.
This application Jul. 22, 1977, Ser. No. 818,251
Int. Cl.[2] B23P *17/00*
U.S. Cl. 29—417 **5 Claims**



1. A method for making radial lip shaft seals having a generally cylindrical reinforcing outer case to which has been bonded an elastomeric body that includes a flexible seal lip portion comprising the steps of, selecting a rigid strip of indeterminate length, feeding said strip continuously through a series of punch press forming operations in a progressive type die to perform the steps of: scoring the strip rearwards of the body edge to establish the width of a rectangular case blank at a first station, the first advance of said case blank to a second die station and trim step establishing the length of said rectangular case blank, a second advance of said rectangular case blank to a third die station where the first form operation starts the bending of said case blank along its major axis with some separation of said score at both edges,

advancing said case blank to a fourth die station with the second form operation increasing the bend of the previous operation forming a "U" and greatly increasing the separation along the score from the edges toward the middle,

advancing said case blank to a fifth die station with the third forming operation closing the "U" of the previous operation and forming the generally cylindrical shape of a finished reinforcing outer case,

placing said finished case in the heated cavity of a mold in a molding press with a quantity of uncured elastomer and

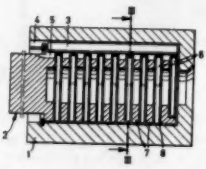
bonding said elastomer to said finished case forming said elastomeric body and said flexible lip seal portion.

4,133,093

METHOD FOR PRODUCING A CYLINDER LOCK

Ilkka Pusa, and Oiva Hurskainen, both of Joensuu, Finland, assignors to Oy Wartsila AB, Helsinki, Finland

Filed Dec. 27, 1976, Ser. No. 754,008
Claims priority, application Finland, Dec. 31, 1975, 753744
Int. Cl.² B23P *13/00, 15/00*
U.S. Cl. 29—434 **5 Claims**



1. A method for the production of a cylinder lock employing a fixed cylinder housing and a cylinder turnable by the key of the lock, a number of locking discs being also turnable by said key at a first stage relative to said cylinder; a locking bar which, in a designated position, locks said cylinder to said cylinder housing and being guided in the radial direction of the lock by said locking discs, said method comprising the steps of: providing said lock cylinder with a set of identical locking discs of sheet metal formed without peripheral recesses for allowing opening of the lock; turning said locking discs with a key member into an opening position defined by said key member; and machining a joint groove at the position of said locking bar into said locking discs, said joint groove suitably corresponding to the form of said locking bar thereby providing at the right position a peripheral recess for the opening of the lock with said key at each of said locking discs.

4,133,094

METHOD OF JOINING A TANK AND SKIRT SUPPORT TOGETHER

Donald C. Stafford, Hinsdale, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Aug. 22, 1977, Ser. No. 826,685
Int. Cl.² B23P *11/02*
U.S. Cl. 29—447 **13 Claims**

1. A method of supporting a metal tank having a circular horizontal section which comprises:

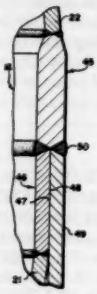
providing the tank with a horizontal ring-like portion having a substantially upright surface,

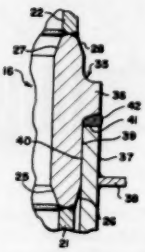
forming a metal substantially upright skirt having a top portion with an internal surface which matches the tank ring-like surface and which has an internal diameter at ambient temperature at matching locations slightly less than the diameter of the tank ring-like surface at ambient temperature,

heating the skirt top portion, or cooling the tank ring-like surface, or both until the internal diameter of the skirt top portion is larger than the diameter of the tank ring-like surface,

positioning the skirt top portion around the tank ring-like surface,

bringing the skirt top portion or the tank ring-like surface or both to ambient temperature to thereby shrink-fit them together, and





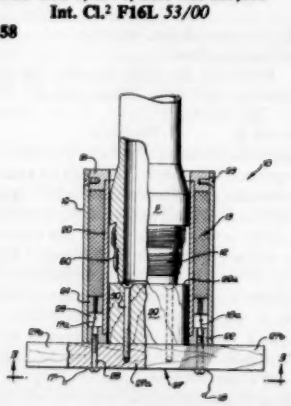
joining the skirt top portion to the tank by welds, bolts or rivets.

4,133,095

TREATING, INCLUDING INDUCTION HEATING OF WELL PIPE CONNECTIONS

George E. Lewis, Arcadia, Calif., and Charles A. Bollfrass, Houston, Tex., assignors to Hydril Company, Los Angeles, Calif.

Filed Oct. 6, 1977, Ser. No. 839,830
Int. Cl.² F16L *53/00*
U.S. Cl. 29—458 **16 Claims**



1. The method of assembling a threaded connection in extremely cold environment, said method employing an electrical coil having cylindrical configuration, said connection defined by a pin connection of a first pipe and a box connection of a second pipe the steps including:

(a) relatively applying the coil to a position about the pin

connection of the first pipe so that the coil extends about the pin connection, and

(b) passing electrical current through the coil to effect induction heating of said pin connection to temperature within the range of 75° F. and 500° F., and

(c) relatively removing the coil from said position, and

(d) relatively applying the coil to a position about the box connection of the second pipe so that the coil extends about the box connection, and

(e) passing electrical current through the coil to effect induction heating of said box connection to about the same temperature as said pin connection, and

(f) relatively removing the coil from said position about the box connection,

(g) there being treating liquid applied to the thread of at least one connection, said induction heating allowing said liquid to flow on said heated pin and box connections, and

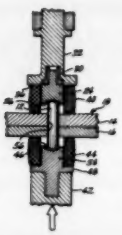
(h) screwing the said pin and box connections together in a relatively equally heated condition.

4,133,096

APPARATUS AND METHOD FOR SELF-POSITIONING A SQUEEZED RIVET

Joseph G. Falcioni, Tacoma, Wash., assignor to Boeing Commercial Airplane Company, Seattle, Wash.

Filed Jul. 5, 1977, Ser. No. 813,045
Int. Cl.² B21J *15/04*
U.S. Cl. 29—522 A **18 Claims**



1. An apparatus for forming positioned rivets from a rivet slug to join together parts of a work piece wherein a fixed tool on one side of the work piece and an axially movable tool on the other side of the work piece cooperate to squeeze form the rivet with the apparatus comprising: resilient means for extending between a fixed tool and a side of a work piece, a die as part of the fixed tool to shape an end of a rivet, resilient means for extending between a movable tool and a second side of the work piece, a die as part of the movable tool to shape an opposite end of the rivet, and the comparative resilience of the resilient members selected to give simultaneous rivet head formation.

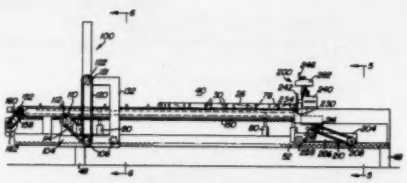
4,133,097

SYSTEM FOR ASSEMBLING FRAMED WALL SECTIONS

Edgar O. Slade, deceased, late of Moyock, N.C. (by Eva Young Slade, administratrix), assignor to Advance Wall Systems, Inc., Langhorne, Pa.

Filed Jul. 5, 1977, Ser. No. 812,967
Int. Cl.² B23P *23/00*
U.S. Cl. 29—564.8 **18 Claims**

1. A system for fabricating a wall for a building, said wall being composed of a framework of plural studs disposed in a parallel array between a pair of opposed plates and sheathing disposed over said framework, said system comprising a first workstation for assembling said studs and plates into said framework, a second workstation for securing said sheathing to the assembled framework and first conveyor means for carrying the assembled framework from the first workstation to the second workstation, said first workstation comprising first means for positioning said studs thereon in a parallel array and second means for positioning each of said plates perpendicular to said studs and in contact with the ends thereof, automatically operating assembly means for assembling said studs and plates into said framework and comprising a carriage supporting securing means thereon and mounted for movement along said plates, said carriage moving along said plates and automatically operative at the location of each of said studs to secure the end of said stud to the abutting portion of the opposed plates, said first positioning means comprising a vertically



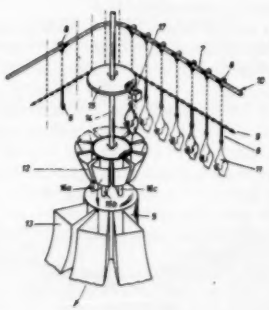
retractable frame having locating pins thereon, said locating pins establishing the spacing between said studs, said first workstation including first cutting means disposed at an upstream portion thereof for removing excess length portions from said plates, said first and second positioning means being retractable to enable said first conveyor means to carry the assembled framework to said second workstation, said second workstation comprising assembling means adapted to secure sheathing disposed thereover in place.

4,133,098

APPARATUS FOR SORTING SUCCESSIVE ARTICLES MOVING ALONG A PATH

Richard M. Brook, Huddersfield, England, assignor to AutoSystems Limited, Yorkshire, England

Filed May 18, 1977, Ser. No. 797,963
Int. Cl.² B07C *5/00*
U.S. Cl. 209—565 **11 Claims**



1. Apparatus for use in sorting a succession of articles which are moving along a path, the apparatus comprising:

(a) a plurality of receiving devices arranged to move adjacent to the succession of articles traveling along the path, so that along at least a part of the path each article moves in unison with one of the receiving devices;

(b) means for transferring each article to a receiving device as it moves in unison with the article;

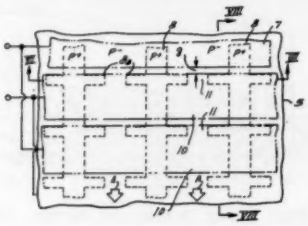
(c) a plurality of delivery stations past which the receiving devices travel; and

(d) a plurality of release devices, one associated with each of the delivery stations, the release devices being selectively operable to release an article at any desired delivery station when the article is carried past the delivery station by a receiving device.

4,133,099
METHOD OF MANUFACTURING A CHARGE TRANSFER DEVICE

Yoshiaki Hagiwara, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 2, 1977, Ser. No. 821,183
Claims priority, application Japan, Aug. 20, 1976, 51-99961
Int. Cl.[2] B01J 17/00
U.S. Cl. 29—578 10 Claims



1. A method of manufacturing a charge transfer device having a plurality of electrodes formed on an insulating layer and a transfer channel formed of a portion of semiconductor substrate transferring signal charges in one direction, said transfer channel having narrowed portions bordered by channel stopper regions formed of a portion of said semiconductor substrate, comprising the steps of:

(a) forming a polycrystalline silicon layer on the insulating layer formed on a major surface of said semiconductor substrate,

(b) forming a first masking layer for selective diffusion of doping impurities and selective removing said polycrystalline silicon layer, said first masking layer covering portions of said polycrystalline silicon layer in a direction substantially transverse to said one direction of charge transfer, leaving uncovered portions of said polycrystalline silicon layer, said uncovered portion having a predetermined width in the direction of said charge transfer and being formed periodically,

(c) forming a second masking layer for selective removing said polycrystalline silicon layer, said second masking layer partially overlying on said first masking layer and leaving openings on the portions of said polycrystalline silicon layer laying over portions of said transfer channel,

(d) selectively diffusing a doping impurity into said polycrystalline silicon layer through said first masking layer,

(e) selectively removing said polycrystalline silicon layer by using said first and second masking layers and forming openings in said polycrystalline silicon layer, and

(f) selectively diffusing a doping impurity into said substrate through said openings.

4,133,100
METHOD OF MAKING DIAPHRAGM OF OPTIMIZED STRESS AND STRAIN DISTRIBUTION

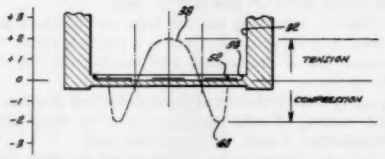
Kjell E. Myhre, 941 N. Enterprise Ave., Inglewood, Calif. 90302

Filed Dec. 27, 1976, Ser. No. 754,251
Int. Cl.[2] H01C 17/02
U.S. Cl. 29—610 SG 2 Claims

1. A method of making an improved transducer diaphragm including the steps of:

chemically etching one face of a diaphragm plate to chemically mill out a central recess of uniform thickness which constitutes an active portion of the diaphragm displaced below the normal surface of the face to form a plurality of monitor areas peripherally located on the central recess where the diaphragm plate undergoes maximum strain when subjected to pressure, and to chemically mill out recess notches extending from the central recess into the non-active portion of the diaphragm and respectively positioned adjacent each monitor area;

mounting the diaphragm plate on a cylindrical spacer having



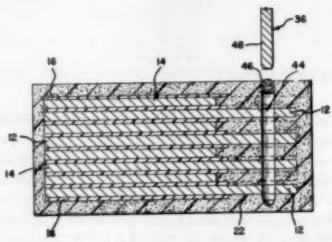
an interior wall displaced from the outer boundary of the central recess and displaced from the notches; and

bonding a strain gauge on the diaphragm plate in each of the notches to directly overlie each of the monitor areas.

4,133,101
METHOD OF FABRICATING A LAMINATED BUS BAR

Douglas W. Glover, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 290,013, Sep. 18, 1972, Pat. No. 3,893,233, which is a continuation-in-part of Ser. No. 152,145, Jun. 11, 1971, abandoned. This application Jan. 9, 1975, Ser. No. 540,030
Int. Cl.[2] B23P 11/00; B29C 6/02; H01R 43/00
U.S. Cl. 29—628 3 Claims



1. A method of fabricating a laminated bus bar, comprising the steps of:

stacking together in alternate layers a plurality of plate conductors of varied surface areas and a plurality of plates of dielectric material,

said plates of dielectric material having surface areas smaller than adjacent plate conductors of relatively greater surface areas and larger than adjacent plate conductors of relatively smaller surface areas,

encapsulating said plate conductors and said plates of dielectric material in a solidifiable dielectric medium,

drilling apertures through said solidifiable medium and at least said plate conductors of relatively larger surface areas,

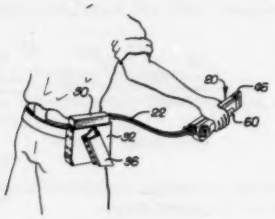
forcefully driving conductive elongated contacts together with quantities of a non-rigidified solidifiable material into corresponding apertures,

wedgingly engaging said contacts into electrically conductive relationship with said plate conductors having said apertures therethrough, the solidifiable material filling voids, and rigidifying said solidifiable material to secure said contacts in said apertures.

4,133,102
AUTOMATIC CONNECTOR PRESSER

George W. Gillemot, Santa Monica, Calif., assignor to John T. Thompson, Santa Monica, Calif., a part interest

Filed Jan. 19, 1977, Ser. No. 760,526
Int. Cl.[2] B23P *19/00*
U.S. Cl. 29—750 11 Claims

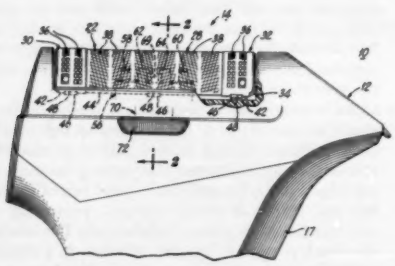


1. In a pressing tool, the combination of:
(a) an elongated housing having a longitudinal axis;
(b) an anvil carried by said housing adjacent one end thereof and inclined at an acute angle relative to said longitudinal axis;
(c) a presser carried by and movable relative to said housing toward and away from said anvil along a presser path perpendicular to said anvil and inclined at an obtuse angle to said longitudinal axis;
(d) an elongated handle within and extending longitudinally of said housing and accessible from the exterior thereof;
(e) means mounting said handle in said housing for producing longitudinal movement of said handle relative to said housing in response to lateral movement of said handle relative to said housing; and
(f) means for converting such longitudinal movement of said handle relative to said housing into movement of said presser along said presser path toward said anvil.

4,133,103
COMB ASSEMBLY FOR AN ELECTRIC DRY SHAVER

William P. Beck, Westchester, Ill., assignor to Sunbeam Corporation, Chicago, Ill.

Filed Nov. 4, 1977, Ser. No. 848,405
Int. Cl.[2] B26B *19/00*
U.S. Cl. 30—43 19 Claims

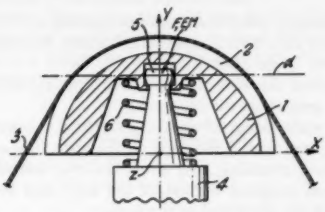


1. A comb assembly for attachment to an electrical dry shaver having cooperating cutter assemblies comprising:
a comb support frame;
a central comb section having a first uniform predetermined thickness, attached to the central position of said comb support frame and being conformed to the outer surfaces of said comb support frame;
at least two end comb sections each having a predetermined thickness greater than said first predetermined thickness, attached to said comb support, engaging the respective abutting surfaces of said central comb section and interfitting along the side edges thereof; and
means for attaching said central comb section and said end comb sections to the peripheral surfaces of said comb support frame.

4,133,104
DRY SHAVERS

Enzo Ascoli, Lausanne, Switzerland, assignor to The Gillette Company, Boston, Mass.

Filed Oct. 21, 1977, Ser. No. 844,190
Claims priority, application United Kingdom, Oct. 30, 1976, 45231/76
Int. Cl.[2] B26B *19/07*
U.S. Cl. 30—43.92 7 Claims

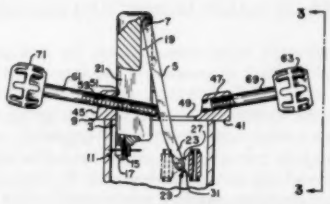


1. A dry shaver comprising a part-cylindrical cutting foil, an inner cutter provided with cutting edges which cooperate with said foil, drive means to drive said inner cutter in linear reciprocation parallel to the axis of said part-cylindrical foil, said drive means including a driver articulated to said inner cutter at a center of articulation substantially coincident with the center of gravity of said inner cutter and the center of application of the resultant of the frictional forces acting between said inner cutter and said foil during reciprocation of said inner cutter by said drive means.

4,133,105
INTERNAL PIPE CUTTER

Richard J. Mittendorf, Berlin Heights, and Raymond H. Morris, Newcomerstown, both of Ohio, assignors to Emerson Electric Co., St. Louis, Mo.

Filed Sep. 16, 1977, Ser. No. 834,060
Int. Cl.[2] B23D *21/06*
U.S. Cl. 30—103 8 Claims

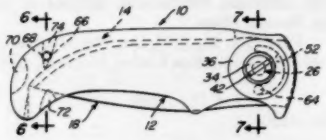


1. In an internal pipe cutter comprising first and second relatively movable members pivoted together, a cutter blade at the free end of said first member, and a pressure assembly at the free end of said second member, said pressure assembly comprising a pair of rollers rotatable about generally vertical axes, the improvement comprising adjustment means for accomodating pipes of different sizes, said adjustment means comprising pivot means for moving said pressure assembly alternatively from a first side of said second member adjacent said first member for cutting pipes of relatively small size, to a second, opposed, side of said second member for cutting pipes of relatively large size.

4,133,106
FOLDING LOCKING BLADE KNIFE

Carl J. Addis, Casper, Wyo., assignor to Wyoming Knife Corporation, Casper, Wyo.

Filed Nov. 17, 1977, Ser. No. 852,201
Int. Cl.[2] B26B *1/04*
U.S. Cl. 30—160 7 Claims

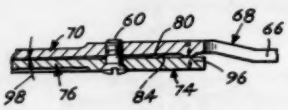


1. A folding locking blade knife comprising:
a first side scale having a pivot end, a free end, and a pivot aperture in the pivot ends;
and a second side scale having a pivot end, a free end, and a pivot aperture in the pivot end;
the two scales being substantially identical in planform;
a blade guard fixedly mounted on the inner face of the first scale and extending only along the rear margin and the free end marginal portion of the scale and terminating short of the pivot end of the scale;
a pivot post passing through both pivot apertures and retaining the two scales in assembled relation spaced apart by the blade guard to provide a protective pocket for a retracted blade;
and a cutting blade having a pivot end tang, a free end, and a pivot aperture in the tang, and being located between the two scales, and being pivotally mounted by its aperture on the pivot post for rotation between retracted and extended positions;
a lock pin projecting from the inner face of the blade guard near the free end of the scale and a corresponding lock hole through the second scale adapted to mate with the lock pin and retain the scales in registered overlying relation;
an arcuate slot through the tang of the blade centered on the pivot aperture and extending around it in an arc of substantially 180 degrees at the side remote from the free end of the blade with its ends in a lateral line across the blade passing through the pivot aperture;
and a single stud mounted in the second scale spaced laterally from the pivot aperture and projecting from the inner face of the second scale to engage in the arcuate slot in the blade;
the second scale, when released from the lock pin, being rotatable through approximately 180 degrees with respect to the blade and the first scale with the single stud traveling to the second end of the slot, and being rotatable through another approximately 180 degrees to swing the blade to fully extended position and return the scale to its initial overlying locked position with the first scale;
the tang of the blade retaining substantially its full width to the butt end and terminating in squared-off corners with a lateral rear marginal butt edge extending between them;
the corner portion of the marginal butt edge adjacent to the back of the tang contacting the forward end of the blade guard as a stop to limit the extension of the blade, and the tang front contacting the side edge of the forward portion of the blade guard to serve as a stop to limit retraction of the blade;
and the interaction of the single stud and the arcuate slot in the blade preventing extension of the blade when the second scale is in the blade retracting position and preventing retraction of the blade when the second scale is in the blade extending position.

4,133,107
TOOL AND METHOD FOR MAKING THE SAME

Kurt A. Vogel, Lisle, Ill., assignor to Donald Eugene Vogel and David Scott Vogel, both of Lisle, Ill.

Continuation of Ser. No. 703,279, Jul. 7, 1976, abandoned. This application Sep. 6, 1977, Ser. No. 830,599
Int. Cl.[2] B26B *13/00*
U.S. Cl. 30—266 12 Claims



1. An improved professional quality tool adapted for cutting, shearing and the like comprising:
first and second cooperating metal members, with each of the first and second members having a first end, a second end and a longitudinal central axis extending between their first and second ends;
a first handle on the first end of the first member;
a second handle on the first end of the second member;
means for interconnecting the first and second members at a connection point disposed between their first ends and their second ends for permitting the first and second members to pivotally move, with respect to each other and about the connection point, between a closed position wherein the second ends of the first and second members are adjacent to each other and an open position wherein the second ends of the first and second members are spaced from each other;
the first and second members each having a shank portion disposed adjacent to the connection point and between the connection point and their first ends, the shank portions each having an outside face, a leading edge that faces the leading edge of the other shank portion when the members are in their open positon, and an inside face that has a planar, substantially flat surface, with the flat, smooth surfaces of the inside faces of the shank portions of the first and second members being substantially parallel to each other but being spaced from each other a predetermined distance and substantially overlying each other as the first and second members approach their closed positions and while the first and second members are in their closed positions;
the first and second members each including a blade portion disposed between their second ends and the connection point, with each of the blade portions having an inside face, outside face and a cutting edge that is ground in the member from the second end of the member to adjacent to the connection point; and
a single bearing dimple disposed on the inside face of the shank portion of one of the first and second members, the bearing dimple being a formed unitary portion of the one member, being positioned substantially between the leading edge and the longitudinal central axis of the one member and having a distal, rounded, projecting end that projects from the planar, substantially flat inside face of the shank portion of the one member, in a direction substantially perpendicular to the inside face, a distance greater than said predetermined distance so that the distal projecting end of the bearing dimple contacts the planar, substantially flat inside face of the shank portion of the other member as the first and second members approach their closed position and while the first and second members are in their closed position and so that as the sole result of the contact between the distal projecting end of the bearing dimple and the inside face of the shank portion of the other member, there is substantially point contact between the cutting edges of the first and second members as the first and second members move from their open

position to their closed position, with this point contact being initially located adjacent to the point where the cutting edges initially intersect, and then moving out along the cutting edges to the second ends of the members as the first and second members continue to move to their closed position.

4,133,108

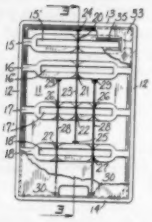
Patent Not Issued For This Number

4,133,109

RIBBON SLITTER

Robert E. Dow, 9 Pasadena Rd., Branford, Conn. 06405

Filed Aug. 8, 1977, Ser. No. 822,871
Int. Cl.² B26B *3/00*
U.S. Cl. 30—279 R **7 Claims**



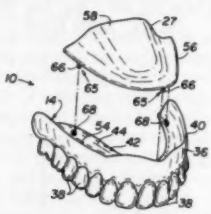
1. A device for slitting ribbon material of a first width into a plurality of ribbon strips of lesser width comprising, a body member defining a plurality of ribbon receiving passages therethrough, a plurality of blades having cutting edges supported in said body member and traversing said passages so as to provide different numbers of cutting edges in different ones of said passages, whereby ribbon may be slit into various pluralities of ribbin strips of lesser width than the original material by passing the original material through selected ones of said passages, each of said blades traversing more than one passage.

4,133,110

ARTIFICIAL MODULAR DENTURE

Richard Bernstein, 17-85 215th St., Bayside, N.Y. 11361, and Joseph P. Matriss, 35 Wallington Ave., Wallington, N.J. 07057

Filed Feb. 18, 1977, Ser. No. 769,915
Int. Cl.² A61C *13/00*
U.S. Cl. 32—2 **6 Claims**



1. A method of producing an artificial denture, comprising the steps of:

A. providing an assembly of hard prosthetic teeth permanently secured to a U-shaped hard base structure with a terminus of said hard base structure disposed a short distance rearwardly of the incisor areas of said assembly of said prosthetic teeth,

B. supplying a set of palatal vault members having a variety of differently contoured configurations adapted to substantially conform with the palatal vault area of a patient's mouth, said palatal vault members adapted to be individually assembled to said assembly whereby the most suitable fitting one of said set of palatal vault members may be determined,

C. assembling a selected one of said palatal vault members to said base,

D. inserting said base with said palatal vault member assembled thereon into a patient's mouth being fitted for the artificial denture so as to obtain a properly fitting palatal vault member of said set as part of the artificial denture,

E. placing an uncured hardenably hard liner material, in fluid form, on said base and said selected palatal vault member,

F. reinserting the denture into the human mouth and impression forming the hard uncured material into an impression in conformance with the palatal vault and the toothless gum area of the patient's mouth, and

G. allowing the uncured hardenable liner to harden over said palatal vault member and to bond thereto to form a rigid liner which conforms intimately to the features of the palatal vault area and the toothless gum area of the mouth.

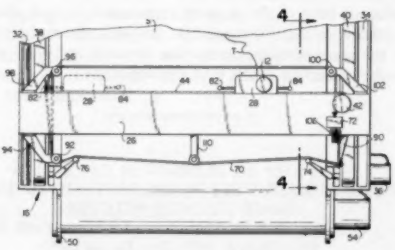
4,133,111

APPARATUS FOR DETECTING LIMITS OF TRAVEL

David J. Logan, Glastonbury, Conn., assignor to Gerber Scientific Inc., South Windsor, Conn.

Filed Jul. 22, 1977, Ser. No. 818,212
Int. Cl.² H01H *17/12;* B23Q *5/00, 5/54*
U.S. Cl. 33—1 M **12 Claims**

10. A machine producing relative movements between a tool and a workpiece comprising: a work tool and a work table for holding a workpiece as it is operated upon by the tool; means for moving the tool and the workpiece mounted on the table relative to one another in at least one coordinate direction between two opposite limits of travel; and limit detecting means for detecting relative movement of the tool and workpiece at said limits of travel and producing a limit signal, said detecting means including a pull cord suspended to form a plurality of interconnected cord segments associated with the opposite limits of travel, means connected with and resiliently tensioning the suspended pull cord and a plurality of cord contacts associated with the limits of travel for engaging respectively cooperative cord segments and pulling the cord in opposition to the resilient tension as relative movement takes place between the tool and workpiece at the associated limits of travel, the detecting means also including a switch means connected to the pull cord for actuation and generation of a limit signal when any segment of the cord is intercepted and pulled by a contact at a limit of travel.



4,133,112

APPARATUS FOR MEASURING A WORKPIECE

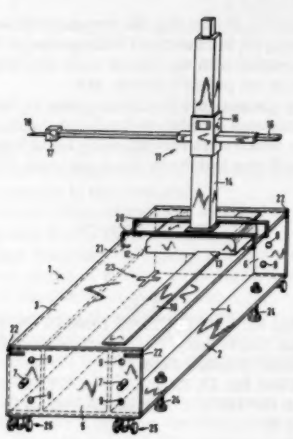
Otto Matthiessen, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 10, 1977, Ser. No. 767,336

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1976, 7604351[U]

Int. Cl.[2] G01B 5/02

U.S. Cl. 33—169 R **17 Claims**



7. Apparatus for measuring a workpiece comprising:

a. support structure formed by a plurality of support elements each having a top portion;

b. means for interconnecting said plurality of support elements;

c. a guide carriage carried by said support structure;

d. means for longitudinally displacing said guide carriage along said support structure;

e. bracketing means for stabilizing the guide carriage, carried by said guide carriage, said bracketing means extending over the entire upper surface of a top plate of one of said support elements and extending beneath the top plate on opposite edge areas thereof by way of end sections of said bracketing means; and

wherein each of the support elements have end plates provided with guide means for allowing the end sections of the bracketing means to pass through and slide along to the underside of the adjacent top plate.

4,133,113

PROPORTIONER DEVICE AND METHOD OF USE OF SAME TO SHIM MOTORS

Harry E. Rider, 4516 Harbison Ave., La Mesa, Calif. 92041

Filed Dec. 5, 1977, Ser. No. 857,132

Int. Cl.[2] G01B 7/31

U.S. Cl. 33—181 R **3 Claims**

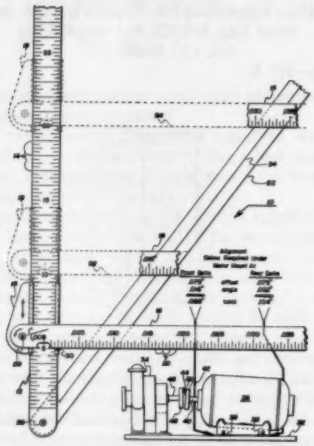
1. A method of shimming a first body having a first shaft with an orthogonal circular, co-axial first face into co-axial with a second body having a second shaft with an orthogonal circular co-axiality second face such that said faces are substantially flush, said bodies resting on a mounting surface, said method utilizing a proportioner instrument having a fixed scale-ruled arm, a sliding scale-ruled arm slidably mounted at right angles to said first arm, and a proportioner arm having a line thereon to register with the scale on said sliding, said method comprising:

(a) measuring the diameter of said first face and moving said sliding arm to register with the diameter so measured as shown on said fixed arm;

(b) measuring the spacing between said faces at the top and bottom of said faces, substracting the measurement at the bottom from the measurement at the top, and locating the difference on said sliding arm with said proportioner arm;

(c) determining the horizontal distance from the second face to a first shim point on said first body, adjusting said sliding arm to register with said distance on said fixed arm, and reading the required shim thickness at said proportioner line on said sliding arm;

(d) repeating step C for a second shim point under said first body.



4,133,114

BUTT HINGE SCREW LOCATION MARKING TEMPLATE

Carl L. Roach, 5912 Marlin, El Paso, Tex. 79924

Filed May 23, 1977, Ser. No. 799,647

Int. Cl.[2] E05B 17/06

U.S. Cl. 33—197 **7 Claims**

1. A butt hinge screw location marking template comprising a first plate of a plan size and shape to be received within a door edge hinge leaf mortise in predetermined position therein,

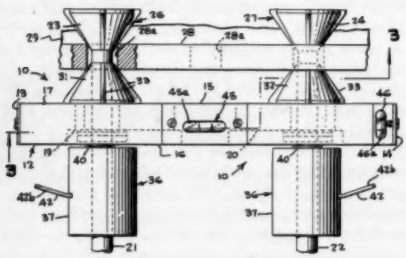
said plate including a plurality of apertures formed therethrough in a predetermined pattern corresponding to the pattern of mounting screws to be used for securing a door hinge leaf in said mortise, a second plate positionable in superposed registry over one side of said first plate, means pivotally securing corresponding marginal edge portions of said plates together for relative swinging movement of the remote marginal edge portions of said plates toward and away from each other, said second plate including outstanding pointed projections supported therefrom centered relative to and projectable through said apertures to positions projecting outwardly of the side of said first plate remote from said second plate upon swinging of said remote marginal edge portions of said plates together.

4,133,115

MULTIPLE VIAL UNIVERSAL FLANGE LEVEL ASSEMBLY FOR FLANGED PIPES AND THE LIKE

Charles A. Stockholm, 7685 Hwy. 105, Beaumont, Tex. 77706

Filed Nov. 3, 1977, Ser. No. 848,148
Int. Cl.² G01C *9/28*
U.S. Cl. 33—371 **4 Claims**



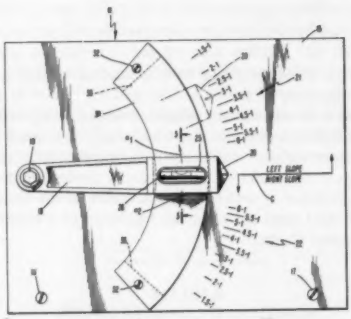
1. A multiple vial flange level assembly for levelling and squaring a planiform circular flange having circumferentially spaced apertures for a flanged pipe section, including an elongated main frame in the form of an elongated rectangular bar having a length sufficient to span a distance greater than the spacing between a pair of adjacent flange apertures, the main frame having a first bubble vial positioned to indicate when the longitudinal axis of said main frame perpendicular to the axis of the pipe section is precisely horizontal and a second bubble vial for indicating when a second axis of the main frame perpendicular to its longitudinal axis and parallel to the axis of the pipe section is precisely horizontal, first pair of centering cone members adapted to enter from one side of and be centered in the flange apertures and each having an elongated rod projecting therefrom to extend through and beyond the flange apertures, a second pair of centering cone members carried by the main frame to receive said rods therethrough and enter and be centered by the flange apertures, and manually releasable latch members mounted on portions of said rods protruding beyond said main frame and second centering cone members for clamping the main frame and cone members onto the flange by clamping engagement of the cone members in the flange apertures, said main frame including a pair of longitudinally elongated slots slidably supporting bushing members through which said rods extend to receive said rods therethrough and accommodate relative convergent and divergent movement of the rods and cone members longitudinally of the main frame for fitting the level assembly onto flanges with various flange aperture spacings, said bushing members being fixed to respective ones of said second pair of cone members supporting the latter for movement axially of said rods relative to said main frame, said bushing members having an enlarged end portion and a curved annular spring washer surrounding smaller diameter portions of said bushing member and bearing against said enlarged end portions and parts of said main frame to resiliently urge the cone members fixed thereto toward an adjacent confronting face of said main frame.

4,133,116

GROUND SLOPE ANALYZER

Billy B. Devine, 1914 General Pershing St., Laurel, Miss. 39440, and Otis E. Robertson, Augusta Rd., Ellisville, Miss. 39437

Filed Jul. 21, 1977, Ser. No. 817,841
Int. Cl.² G01C *9/28*
U.S. Cl. 33—386 **5 Claims**



1. A device for analyzing the slope of graded ground directly from a vehicle doing the grading, comprising a base, means for mounting said base directly on the vehicle in a readily viewable position by an operator of the vehicle, an indicator arm pivotally mounted on said base and manually adjustable by the operator during the grading operation to different positions corresponding to desired slopes being graded by the vehicle, indicia means on said base corresponding to the desired slopes of the ground, means for retaining said indicator arm in an adjusted position corresponding to a selected slope indicia, said retaining means including a guide plate and a frictional mating surface on said arm, the pivot point for said arm being formed by an adjustable fastener at the fixed end of said arm, and said guide plate being located adjacent the movable end of said arm, said guide plate including a curved spring strip fixed on said base, the central portion of said strip along the range of indicia being raised into biased frictional engagement with said arm, and level means on said arm to indicate when said vehicle is positioned on the graded ground at the selected slope.

4,133,117

STIFFENER FOR SHOES OR THE LIKE

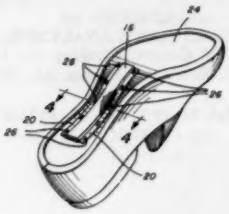
Robert W. Bradley, Marblehead, Mass., assignor to Bush Universal, Inc., Woburn, Mass.

Filed Feb. 3, 1977, Ser. No. 765,096
Int. Cl.² A43B *13/42;* A43D *0/00*
U.S. Cl. 36—76 C **21 Claims**

1. An article for use as a shoe reinforcement comprising:
an envelope surrounding a matrix which includes an externally activatable thermosetting resin;
said envelope having first and second surfaces on opposite sides of the matrix to enable the first surface to be applied to and against a surface of a shoe member which is to be reinforced;

said second surface being formed from a material through which a selected external stimulus may be passed thereby to activate said resin material;

said envelope having means for enabling said second surface to overlie and confine the matrix and said first surface



within a volume defined by said second surface and said shoe member;

at least said second surface of said envelope being defined by and formed from a material which will maintain its physical characteristics sufficiently to substantially preclude enlargement of said volume beyond a predetermined maximum volume in response to activation of the resin material at least until the resin has hardened to a substantially permanent shape.

4,133,118

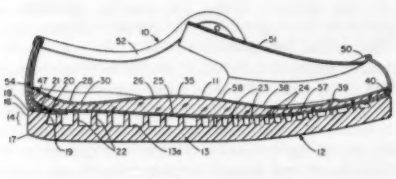
FOOTWEAR CONSTRUCTION

Gurujot S. Khalsa; Lehri S. Khalsa, both of 1704 Q St., NW., Washington, D.C. 20009, and Harbhajan S. K. Yogiji, Hacienda De Guru Ram Das, Rte. 1, Box 132-D, Espanola, N. Mex. 87532

Filed May 6, 1977, Ser. No. 794,385

Int. Cl.[2] A43B *13/20, 13/38*

U.S. Cl. 36—83 **5 Claims**



1. Footwear comprising an inner sole, outersole, and upper, said outersole integrally formed of flexible resilient material and comprising heel, toe, and arch regions, and

a bottom portion,

a sidewall extending about the periphery of and upwardly from said bottom, said sidewall and bottom having a common peripheral outer surface extending from the lower edge of said bottom to upper outer edge of said sidewall, said sidewall having an inner surface extending upwardly from said bottom and terminating in an upper inner edge, said sidewall having an upper surface defined by said inner and outer edges, said common peripheral outer surface have a height at the arch region of approximately twice the height at the heel and toe regions, a plurality of elongated ridges integrally formed in said bottom portion and extending across the upper surface of the bottom portion between opposite portions of said sidewall, said ridges at the instep region tapering from the arch side to a lower height on the opposite side and with said ridges at the arch region greater than the height of the ridges at the heel and toe regions.

4,133,119

SKI BOOT

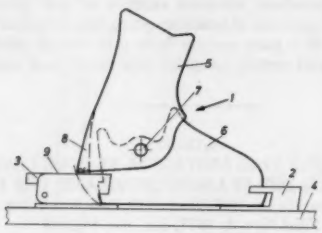
Axel R. Kubelka, Vienna, Austria, assignor to TMC Corporation, Zug, Switzerland

Filed Feb. 22, 1977, Ser. No. 770,586

Claims priority, application Austria, Feb. 25, 1976, 1410/76

Int. Cl.[2] A43B *5/04; B62B 0/00*

U.S. Cl. 36—121 **15 Claims**



1. The combination of a ski boot and a ski binding for releasably securing said boot to a ski, said ski boot having a lower shell with a raised rear wall and an ankle cuff pivotally secured to said lower shell to allow pivotal movement of said ankle cuff about a pivot axis in response to shifts in the weight of an individual using said ski boot, said ski binding including at least a heel holder fixedly secured to said ski and engaging the heel portion of said ski boot to hold said heel portion to a ski, wherein said ankle cuff has projection means extending rearwardly therefrom and includes first means thereon defining a downwardly facing first surface and wherein said heel holder is wholly separate from said ski boot and includes second means defining an upwardly facing second surface, said first surface directly engaging said second surface to limit the amount of pivotal movement of said ankle cuff to the rear of said lower shell.

4,133,120

DREDGING APPARATUS WITH SPRING-SUPPORTED BUCKET LADDER

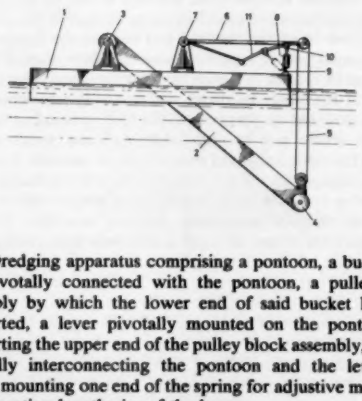
Jacobus M. Donkers, Zaandam, Netherlands, assignor to N.V. Industrieele Handelscombinatie Holland, Rotterdam, Netherlands

Filed Jun. 10, 1977, Ser. No. 805,432

Claims priority, application Netherlands, Jun. 10, 1976, 7606282

Int. Cl.[2] E02F *3/16*

U.S. Cl. 37—69 **4 Claims**



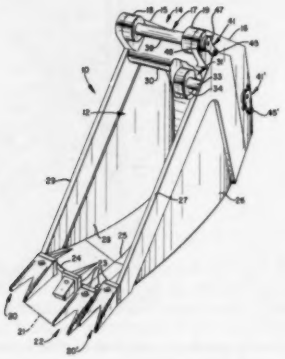
1. Dredging apparatus comprising a pontoon, a bucket ladder pivotally connected with the pontoon, a pulley block assembly by which the lower end of said bucket ladder is supported, a lever pivotally mounted on the pontoon and supporting the upper end of the pulley block assembly, a spring pivotally interconnecting the pontoon and the lever, and means mounting one end of the spring for adjustive movement in a direction lengthwise of the lever.

4,133,121

BACKHOE BUCKET ADAPTER BUSHING AND PIN METHOD AND APPARATUS

Charles W. Hemphill, 1106 Green Valley La., Duncanville, Tex. 75116

Continuation-in-part of Ser. No. 715,560, Aug. 18, 1976, Pat. No. 4,037,337. This application Jul. 21, 1977, Ser. No. 817,733
Int. Cl.[2] E02F *3/00*
U.S. Cl. 37—118 R 5 Claims



1. In a backhoe machine of the type having a dipper stick attachable to a digging bucket by an upper receptacle located on the end of the dipper stick and spaced from a lower receptacle which is actuated by a curling cylinder, the improvement comprising:

said bucket having spaced lifting ears rigidly affixed to a rear wall thereof, upper and lower apertures formed in said ears with the uppermost apertures being axially aligned with one another and the lowermost apertures being axially aligned with one another, thereby providing an upper and a lower pair of apertures;

a bushing having a thimble and a flange, with the thimble having an outside diameter of a size to be removably received in close tolerance relationship within each said aperture, with the flange thereof abutting the inner face of said ear so that the flanges of said upper pair of bushings and the flanges of said lower pair of bushings are opposed to one another and abuttingly received against adjacent opposed faces of the ears;

an axial hole formed through each said bushing, a lifting pin received by said upper bushings thereby leaving a medial length of said pin by which said upper receptacle is pivotally affixed to said bucket;

a lifting pin received by said lower bushings thereby leaving a medial length of said pin by which said lower receptacle is affixed to said bucket;

whereby said bucket is attached to said dipper stick by a medial length of said upper and lower pins, and said upper and lower pins can be removed from said bushings and said receptacle to thereby remove the bucket from the dipper stick.

4,133,122

CARRIAGE ASSEMBLY FOR AN ELEVATING SCRAPER DUMP LINKAGE AND METHOD OF INSTALLING

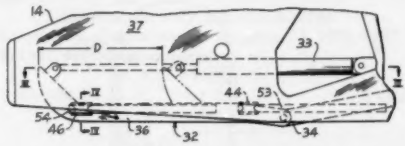
William T. Girard; Warner G. Richardson, and Eugene M. Wilson, all of Joliet, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 15, 1977, Ser. No. 824,778
Int. Cl.[2] B21K *1/02;* E02F *3/62*
U.S. Cl. 37—126 AE 4 Claims

1. In a carriage assembly having a pair of spaced parallel sidewalls and a carriage positioned between the sidewalls, said carriage having first and second sides and being reciprocable between first and second positions, said first position being spaced from said second position a first preselected distance, the improvement comprising:

first and second pairs of rollers rotatably connected to respective first and second sides of the carriage; and

first and second rail means secured to the respective sidewalls, said first rail means having first and second elongate rails positioned in end-to-end relationship with adjacent ends being spaced one from the other a second preselected



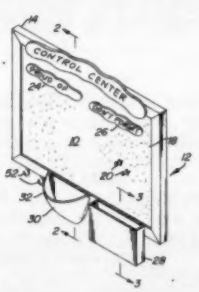
distance, said first pair of rollers being rollably carried by respective first and second rails, said second pair of rollers being rollably carried by said second rail means, said second preselected distance being sufficient for positioning of one of the first pair of rollers between the adjacent ends of the first and second rails, each of said first and second rails having a length at least equal to said first preselected distance.

4,133,123

UTILITY BULLETIN BOARD

Sandra Anderson, P.O. Box 345, Perryville, Md. 21903

Filed Nov. 1, 1976, Ser. No. 737,774
Int. Cl.[2] G09F *11/00*
U.S. Cl. 40—1 7 Claims



1. A work control center system for maintaining materials in a central location, comprising:

(a) a planar member adapted for releasable mounting of said materials thereto;

(b) storage means secured to a frontal wall of said planar member adapted for removable insert of said materials; and,

(c) insert means secured to said frontal wall of said planar member, said insert means having a contour distinct from said storage means, said insert means being cup-shaped in contour extending frontally from said frontal wall in an arcuate contour, said insert means adapted for inert of a hand of a user, said insert means further including locking means mounted to an upper wall member of said cup shaped insert means.

4,133,124

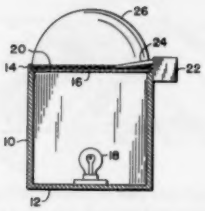
DISPLAY DEVICE

Karl Chang, and Dora D. J. Chang, both of 2449 Sonoma St., Honolulu, Hi. 96822

Continuation-in-part of Ser. No. 647,335, Jan. 8, 1976, abandoned. This application Aug. 18, 1976, Ser. No. 715,490

Int. Cl.[2] G09F *13/24*

U.S. Cl. 40—408 **3 Claims**



1. A device for displaying to a viewer situated to the side of the device interference patterns created by reflection of light from a thin film comprising: a light source; a housing constructed of opaque material surrounding the light source, the housing having an opening at its top whereby light from the light source emanates from the opening; a translucent plate commensurate in size with the opening in the housing; means for supporting the translucent plate over the opening; and a lip surrounding the translucent plate to define a reservoir having the translucent plate as a bottom and the lip as its sides to contain a bubble-producing liquid, the reservoir having a depth small compared to its surface dimensions; whereby a bubble blown from the liquid forms a thin film in the form of the truncated sphere with the truncation disposed over the opening, the thin film having first and second reflective curved interfaces at a separation sufficiently small to produce interference effects, a portion of the thin film being concave towards the viewer, such that light directed from the opening reflects from the interfaces to the eyes of the viewer, causing interference effects between the light reflected from the first interface and the light reflected from the second interface.

4,133,125

SELF-ERECTING SIGN POST

Oscar A. Lariosa, 6734 NW. 5th Ave., Miami, Fla. 33150

Filed Mar. 24, 1977, Ser. No. 780,814

Int. Cl.[2] G09F *15/00*

U.S. Cl. 40—608 **4 Claims**

1. A self-erecting sign post comprising in combination, a fist elongated metal post section, a second, comparatively-short, elongated metal post section, said first and second post sections normally being disposed is axially spaced, coaxial disposition, an elongated rigid but frangible section, means connecting opposite end portions of said frangible section to opposing end portions of said first and second post sections for normally retaining said post sections in rigidly interconnected relative disposition, and spring means interconnecting said opposing end portions of said first and second post sections, said frangible section constituting a zone of weakness operative to break before said first post section bends upon impact, said spring means comprising a helical spring circumjacent said frangible section and being operative to restore said first post section to its relatively aligned position, said second post section being adapted to be buried in the ground for supporting the sign post in erect position, the upper end of said second post section having affixed thereto in transverse relation a plate member adapted to abut at its underside the ground surface at which

the sign post is installed, one end of said helical spring being secured to said plate member.

4,133,126

AMMUNITION LOADING AND EJECTION ARRANGEMENT

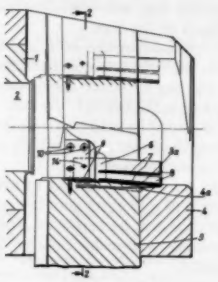
Herbert Lipp, Dusseldorf, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Dusseldorf, Fed. Rep. of Germany

Filed Aug. 4, 1977, Ser. No. 821,598

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1977, 2704602

Int. Cl.[2] F41C *11/04*

U.S. Cl. 42—23 **3 Claims**



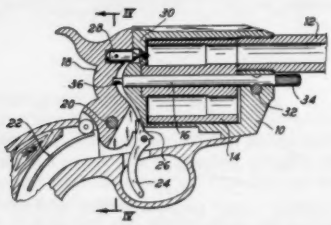
1. A device for facilitating the insertion and ejection of short cartridges in a weapon having a loading channel for guiding cartridges being inserted to and ejected from a barrel, said loading channel having a half-cylindrical surface crossing over abutting misaligned edges between a sliding breech block and a breech plate, comprising:

a flexible deflecting blade having a barrel end and a breech plate end extending over said misaligned edges, which breech plate end of said deflecting blade is divided by at least one lengthwise slit into at least two flexible members, whereby said flexible deflecting blade forms a smooth surface extending over said misaligned edges.

4,133,127
SAFETY DEVICE FOR OBSOLETE CYLINDER FIREARMS

Armando Piscetta, 4, Via delle Fornaci, Loano, Italy

Filed Nov. 21, 1977, Ser. No. 853,576
Claims priority, application Italy, Jul. 26, 1977, 26115 A/77
Int. Cl.[2] F41C *17/08*
U.S. Cl. 42—66 5 Claims

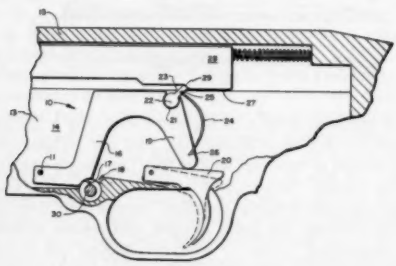


1. An obsolete firearm of the revolver type including a cylinder mounted for rotation about an axially locked cylinder shaft in a frame having a breech forming rear portion and a trigger actuated hammer positioned at the rear of said breech portion and designed for reaching a striking position closedly adjacent to said breech portion when the firearm is fired, wherein the shaft is firmly associated with gunman operatable locking means for selectively locking it at either of two different rotational positions, the said shaft has a rear end portion having a rearwardly directed extension off-set of the shaft axis and rearwardly jutting out from said breech portion and facing the hammer, and the said hammer has a recess turned towards said extension and so positioned that when said shaft is locked in one of its said two rotational positions the said extension can freely enter in said recess when the hammer is triggered for firing, while when the same shaft is locked at the other of its said positions the said extension abuts on a not recessed part of the hammer preventing said hammer from completing its full and firing stroke.

4,133,128
SAFETY DEVICE FOR RIFLES

Clyde E. Brush, P.O. Box 222, Delta, Utah 84624

Filed Aug. 18, 1977, Ser. No. 825,601
Int. Cl.[2] F41C *17/08*
U.S. Cl. 42—70 R 5 Claims

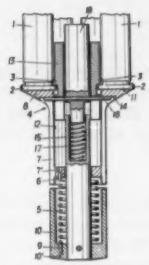


1. A safety device for rifles having a reciprocating breechblock with a shoulder on the bottom thereof positioned within a walled receiver and a trigger, said safety device comprising
a breechblock locking device;
means pivotally mounting said breechblock locking device within the receiver beneath the breechblock and to have at least a portion thereof in engagement with the trigger whereby pulling of the trigger will raise the breechblock locking device; and
means on the breechblock locking device to engage the shoulder on the bottom of the breechblock when the breechblock is in an opened position to thereby hold said breechblock in the opened position.

4,133,129
RAPID LOADING DEVICE FOR REVOLVERS

Heinz Jelinek, Kaiserebersdorferstrasse 218, 1110 Vienna, and Fritz Carmann, Helferstorferstrasse 3, 1010 Vienna, both of Austria

Filed Aug. 22, 1977, Ser. No. 826,706
Claims priority, application Austria, Aug. 23, 1976, 6225/76; Jun. 28, 1977, 4564/77
Int. Cl.[2] F42B *39/04*
U.S. Cl. 42—89 8 Claims

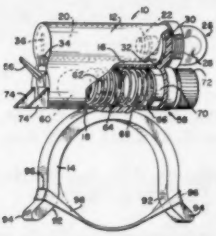


1. A rapid loading device for loading a plurality of cartridges having rims at their rear ends into a revolver, the device comprising:
an annular plate for receiving the rear ends of all the cartridges
a central axis extending centrally of, and at right angles to the plane of said plate,
a cartridge retaining member angularly movable about said axis to bring retaining means on the member into and out of engagement with the rear rims of all the cartridges simultaneously, and
compression spring means acting along said axis to urge the retaining means against the said rims.

4,133,130
SIGNALLING MEANS FOR A FISHING ROD

Russell L. Young, Jr., 424 Washington St., Boonton, N.J. 07005

Filed Oct. 6, 1977, Ser. No. 840,056
Int. Cl.[2] A01K *97/12*
U.S. Cl. 43—17 11 Claims



1. Signalling means for a fishing rod, comprising:
a housing:
said housing having means extending therefrom for clasping said housing to a fishing rod; and
a signalling assembly carried by said housing;
said signalling assembly including means defining an electrical circuit having, in series connection, a signal emitter, switching means for opening and closing said circuit, and

contact means for contacting terminals of an electrical storage battery; wherein

said contact means comprise electrical leads disposed in spaced apart relationship, to define a circuit interruption therebetween;

said switching means comprises an element pivotally coupled to, and projecting from, and housing, for movement from a first position relative to said housing to a second position relative to said housing;

said element having means for engaging and bridging across said interruption to effect electrical continuity between said leads, upon said element moving from said first position to said second position, to close said circuit; and further including

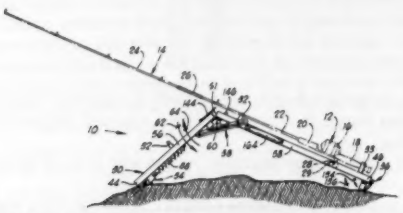
means carried by said housing biasing said element in said first position, and for detenting said element in said second position.

4,133,131

FISHING ROD STORAGE AND SUPPORT APPARATUS

Jerry D. Davy, 1201 SW. 94, Oklahoma City, Okla. 73109

Filed Mar. 14, 1977, Ser. No. 777,564
Int. Cl.[2] A01K *97/08, 97/10*
U.S. Cl. 43—21.2 **9 Claims**



1. A fishing rod storage and support apparatus for supporting a rod and reel assembly, comprising:

a support platform having a first end and a second end, and comprising a first platform member and a second platform member;

connector means for pivotally connecting the first and the second platform members, the connector means disposed between the first and second ends of the support platform, the support platform having a fishing mode wherein the first platform member is angularly disposed relative to the second platform member at a selectable angle, the support platform also having a storage and display mode wherein the first and second platform members are positioned to extend generally in planar relationship;

brace means for alternatively locking the support platform in the fishing mode and in the storage and display mode; and

holding means for removably connecting the rod and reel assembly to the support platform in each of said modes.

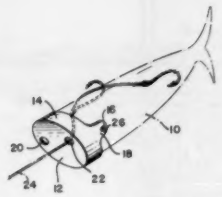
4,133,132

PLUG-CUT HERRING PROTECTOR

Cadwalader H. Ellis, 2621 37th Ave. West, Seattle, Wash. 98199, and Arthur K. Ellis, 214 S. 31st Ave., Yakima, Wash. 98902

Filed Mar. 28, 1977, Ser. No. 781,843
Int. Cl.[2] A01K *97/00*
U.S. Cl. 43—41 **3 Claims**

1. A protector for covering the angularly cut face of a plug-cut herring, comprising a planar cover member having a shape corresponding to the shape of the front face of said plug-cut herring, said cover member being surrounded by a relatively narrow wall intersecting said cover member at first and second sides of said cover member at approximately 45° and 135°, respectively, and at the top and bottom of said cover member at approximately 45° and 135°, respectively, such that the inside face of said cover member is adapted to flushly contact the angularly cut face of said plug-cut herring when said wall extends rearwardly a relatively short distance along the outside of said plug-cut herring parallel to the longitudinal axis of said plug-cut herring so that said wall does not unduly cover the body flesh of said herring, said cover member having an aperture formed therein adapted to allow a fishing leader and hooks to freely pass rearwardly through said cover member into said plug-cut herring, and securing means for fastening



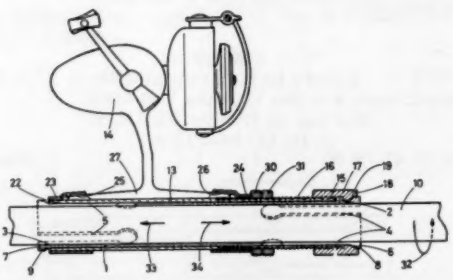
said cover member to said plug-cut herring such that the cut front face of said herring facilitates dispersal of the scent from the retained viscera of said herring and said protector, while occupying a relatively small portion of the bait length, prevents deterioration of the cut front face of said herring while allowing said fishing leader and hooks to pass directly and freely into said herring.

4,133,133

REEL HOLDER

Jacques G. Casset, Granada, Spain, assignor to Strateurop S.A., Granada, Spain

Filed Dec. 13, 1977, Ser. No. 860,054
Claims priority, application France, Jan. 10, 1977, 77 00540
Int. Cl.[2] A01K *87/06*
U.S. Cl. 43—22 **8 Claims**



1. A reel holder for a fishing rod comprising a first tubular element slidable on a fishing rod, said first tubular element being formed at each end with at least one lengthwise slot and a raised annular flange split by the lengthwise slot, a second tubular element slidably mounted around said first tubular element between the raised flanges, said second tubular element supporting means for locking a fishing reel to the reel holder and having a threaded end and an opposite end, a nut, positioned on the threaded end, having one end extendable beyond said threaded end, wherein at least one of the one end of said nut and the adjacent raised flange and at least one of the opposite end of said second tubular element and the adjacent raised flange have tapered surfaces so inclined that when the reel holder is positioned on a rod and said nut is partially unscrewed, the one end of said nut and the opposite end of said second tubular element bear against the raised flanges to simultaneously tighten each end of said first tubular element on the rod.

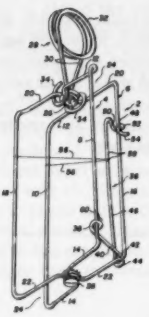
4,133,134
FISHING LURE
Fred F. Cheng, 23027 Enadia Way, Canoga Park, Calif. 91307
Filed Jun. 13, 1977, Ser. No. 805,890
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.06 **2 Claims**

1. A fishing lure comprising:
a hollow tube adapted to receive a supply of water-soluble scented bait, said tube having first and second axial ends;
an elongated spinner shaft extending coaxially through said tube and protruding outward from both its first and second axial ends; and
means at said first and second axial ends of the tube for rotatably mounting the tube relative to the shaft and for permitting axial flow of water through the tube;
wherein at least a portion of the exterior surface of the tube is flocked for retention of scent materials applied thereto.

4,133,135
FISHING LURE WITH DOUBLE SPINNER
James R. Miles, Winnsboro, La., assignor to Miles Lure Co., Inc., Winnsboro, La.
Filed Nov. 11, 1976, Ser. No. 741,118
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.13 **13 Claims**

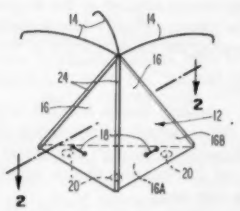
12. A fishing lure comprising a hook having a weighted head, a wire extending from said head and including means thereon for connection with a fishing line, and a pair of spinner blades mounted on said lure in alignment with each other and in alignment with the hook, said blades being spaced from each other and spaced from the wire and being oriented only on the same side of the wire as the hook whereby the orientation of the center of gravity of the lure combined with the aligned relation of the spinner blades and hook will assure that the lure is stabilized during relative movement between the lure and the water, said hook including a shank portion and a hook portion, said spinner blades being in alignment with the hook portion of the hook, each of said spinner blades being swivelly supported from the terminal end of a supporting wire, the spinner blade adjacent the hook being mounted on a wire supporting arm connected with the weighted head and extending laterally therefrom, the spinner blade remote from the hook being connected to a laterally extending wire rigid with the wire extending from the weighted head and having means thereon for connection with a fishing line with both laterally extending wires being fixed with respect to the wire extending from the weighted head.

4,133,136
ROTATING FRAME ANIMAL TRAP WITH IMPROVED TRIGGER
Frank R. Conibear, Victoria, Canada, assignor to Woodstream Corporation, Lititz, Pa.
Filed Oct. 25, 1977, Ser. No. 845,405
Int. Cl.[2] A01M *23/26*
U.S. Cl. 43—92 **14 Claims**



1. An animal trap having two similar frames each having jaw forming sides and ends extending between the sides to support the jaws, the ends having a central portion in which the frames are pivotally engaged through adjacent ends for rotation about a common axis between set and closed positions and outer portions on each side of the central portion extending to said jaws, at least one actuator capable of rapidly and forcefully effecting such a rotation, which actuator has two arms spring biased at one end so that the other ends, which terminate in rings encircling adjacent ends of both frames on opposite sides of said axis would, if unobstructed, move apart to a distance substantially greater than the length of the frame ends and a trigger means for releasably maintaining the trap in set position, the trigger means comprising a trigger lever pivotally connected to a first frame and extending, when the trap is in the set position, to engage releasably the second frame at a first point and at a second point, spaced from the first point, contact means extending, when the trap is in the set position, from the trigger lever across the trap whereby movement of said contact means moves said lever from engagement of the first and second points and thus releases the trap from the set position.

4,133,137
INSECT TRAP
Martin M. van Adelsberg, King of Prussia, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.
Filed Jul. 20, 1977, Ser. No. 817,301
Int. Cl.[2] A01M *1/14*
U.S. Cl. 43—114 **10 Claims**



1. A self-deploying insect trap comprising:
(a) a closed hollow polygonal body, all surfaces thereof being flat and formed from a single scored rigid planar

sheet, having an insect attracting insecticide therewithin when said body is assembled, at least one surface having at least one aperture for passage therethrough of insects into said hollow body when said trap is deployed;

((b) a plurality of curvilinear funicular means extending divergently outwardly from said body, for entangling branches of vegetation upon airborne passage of said body proximate thereto thereby suspending said body therefrom; and

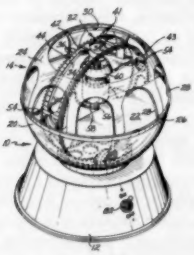
(c) tensioned elastic resilient means, secured to at least some surfaces of said body, for urging said surfaces to converge towards one another into positions forming said closed hollow body from said sheet, as said elastic resilient means contracts to at least partially relieve tension therein, by rotation of said surfaces with respect to each other along score lines of said sheet.

4,133,138

BUBBLE FORMING AND PROJECTING DEVICE

Scott Coons, 5511 Erlands Pt. Rd., Bremerton, Wash. 98310

Filed Mar. 17, 1977, Ser. No. 778,508
Int. Cl.[2] A63H *33/28*
U.S. Cl. 46—6 **26 Claims**



1. A bubble forming and projecting toy comprising:

a housing including a base and a chamber wherein the base supports the chamber, and the chamber has a lower, first portion defining a reservoir suitable for containing bubble forming liquid, a second portion defining an air exit aperture through which air is expelled from the toy, and a third portion defining an air entry means to allow entry of air into the chamber;

a ring having an inner surface, an outer surface and a plurality of bubble forming apertures spaced about its circumference;

ring mounting means secured to the housing for mounting the ring for rotation about a substantially horizontal axis and for locating the lower portion of the ring within the reservoir;

an air impeller;

air impeller mounting means secured to the housing for mounting the air impeller for rotation about an axis that passes substantially through the center of the air exit aperture and for locating the air impeller substantially within the ring; and

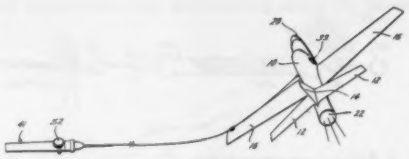
drive means secured to the housing to cause rotation of the ring and the air impeller about their respective axes, wherein the air impeller draws air into said chamber through said air entry means and propels the air generally upwardly through the ring and the exit aperture.

4,133,139

JET-PROPELLED MODEL AIRPLANE

Victor Stanzel, Schulenburg, Tex. 78956

Filed May 13, 1977, Ser. No. 796,541
Int. Cl.[2] A63H *27/04, 27/06*
U.S. Cl. 46—249 **12 Claims**



1. A toy aircraft comprising:

an elongated body having wings and a tail assembly attached thereto;

centrifugal fan means housed within said body for powering said aircraft, said fan means adapted to rotate about an axis perpendicular to the longitudinal axis of the aircraft body;

a remote drive unit for driving said fan means;

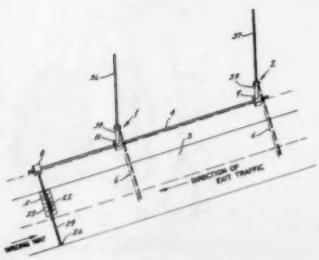
an elongated flexible drive cable extending between and operatively connected to said remote drive unit and said centrifugal fan means for rotatably driving said centrifugal fan means from said drive unit.

4,133,140

SAFETY MECHANISM FOR HIGHWAY EXIT RAMP

Louis N. Berard; Alfred G. Hollmann, and Leonard A. Stein, all of St. Louis, Mo., assignors to Devices Development Corporation, St. Louis, Mo.

Filed Nov. 14, 1975, Ser. No. 631,830
Int. Cl.[2] E01F *13/00*
U.S. Cl. 49—49 **13 Claims**



1. A warning device for alerting a driver of a vehicle as to the vehicle's incorrect direction of movement upon an exit ramp or other roadway comprising detection means provided within the roadway and of the type capable of sensing the presence and incorrect direction of movement of a vehicle thereacross, a warning member and a support column therefor, said warning member and support column being supported laterally of the ramp or other roadway, said warning member being pivotally mounted upon said column and capable of being disposed in a nonoperative position and then pivoted into a horizontal position operatively across the roadway when actuated by the said detection means, said warning member and column includes a base, said column being fixed to the base, a housing provided upwardly of said column, said housing including a rack and pinion, said warning member being mounted to said pinion for pivotal movement therewith, said rack having an extension from its lower end, a detent means operatively associated with the rack extension and normally retaining said warning member in its nonoperative position, spring means operatively associated with said extension and normally biasing said warning member into its operative position upon release of said detent means in response to the detec-

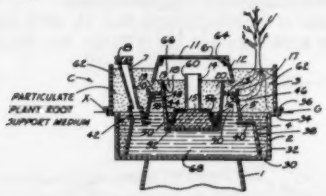
tion means, coupling means interconnecting between the detection means and the column for initiating the operative pivotal positioning of said warning member, and said warning member capable of resiliently pivoting horizontally substantially along the length of the roadway when contacted by a vehicle.

4,133,141

APPARATUS AND METHOD FOR GROWING PLANTS

Choong W. Lee, No. 1 Pesiaran Stonor, Kuala Lumpur 04-08, Malaysia

Filed Dec. 16, 1977, Ser. No. 861,366
Int. Cl.[2] A01G 9/02, 31/02
U.S. Cl. 47—79 17 Claims



1. A plant-growing device, comprising:
an upwardly open receptacle, having a floor and an upstanding outer peripheral wall;
wall means separating the interior of the receptacle into three regions: a plant-growing region adapted to contain a body of particulate, plant root-support medium in which plants may be rooted, a water compartment and a nutrient container;
said wall means providing a first interface with a first path of physical communication between the plant-growing region and the water compartment and a second interface with a second path of physical communication between the plant-growing region and the nutrient container;
wall means dividing the nutrient container into a first chamber for containing a bulk supply of plant nutrients in concentrated form, a second chamber for receiving a capillary medium in contact with said second path, and a third path of physical communication between the first and second chambers distally of said third path, so that plant nutrients, to reach the plant-growing region from said bulk supply, must traverse from said third path to said second path, across said capillary medium, at least largely by capillary action;
and basin means for catching a limited quantity of water in the vicinity of said second path, and in communication therewith, for providing at least some of the moisture necessary for retarding said capillary action.

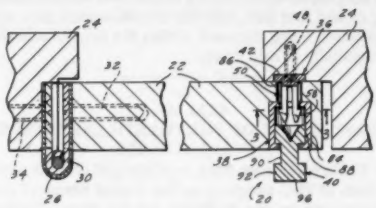
4,133,142

LATCH

Theodore Dzus, Jr., Islip, N.Y., assignor to Dzus Fastener Co., Inc., West Islip, N.Y.

Filed Oct. 11, 1977, Ser. No. 840,835
Int. Cl.[2] E05F 1/00
U.S. Cl. 49—379 5 Claims

1. A latch for releasably holding two members together comprising; a stud adapted to be mounted in fixed position on one of the members, a receptacle adapted to be mounted in fixed position on the other of the members and located to engage with the stud when the members are brought together, coupling means on the stud and receptacle to automatically couple and hold the two members together, release means on the stud and receptacle and exposed for actuation to uncouple the latch and permit the members to be separated, the coupling means including at least one flanged finger on one of the stud and receptacle and resiliently displaceable and a fixed rim on the other of the stud and receptacle so that when the stud and receptacle are engaged the flanged finger will displace and engage the rim to close the latch, the release means including a surface to direct the resilient finger away from engagement with the rim and release the latch when the release means is actuated, the at least one resilient finger being on the stud and the stud being mounted on a door frame, the receptacle being in the form of a cup having an annular rim adjacent an open end, the receptacle being mounted on the door in fixed position so that when the door is closed the resilient finger will be resiliently displaced by engagement with the cup as it passes through the opening therein until it can resiliently shift into engagement with the rim adjacent the opening of the cup, the release means being in the form of a plunger assembly with a reduced diameter portion extending through a second opening in the cup-shaped receptacle and a larger head portion captured within the receptacle and shiftable into and out of engagement with the resilient finger so as to displace the resilient finger from engagement with the rim and permit the finger to be removed from the receptacle and the door to be opened, the reduced diameter portion extending through the opening terminating in an exposed button adapted to be manually displaceable to cause the plunger head to release the resilient finger



from engagement with the rim, the at least one resilient finger including four resilient fingers extending from a base plate, the base plate adapted to be mounted to the support, each finger having a resilient stem portion terminating in a flanged head, the outer configuration of the head being fustroconical in configuration and the end of the head adjacent the stem forming a shoulder, each head tapering outward from the free end to the end attached to the stem, the four fingers having mating heads to form a fustroconical tip having a narrow diameter free end and a larger diameter end forming a shoulder in engagement with the spaced stems of the fingers, the resilient fingers being normally positioned with their heads in spaced relationship and adapted to be resiliently deformed so that the heads of the fingers are brought into engagement, the heads being spaced so that insertion of the fingers into the opening in the end of the receptacle will cause the tapered heads to be directed toward one another until the heads pass through the opening in the cup whereupon the resilient fingers will cause the heads to separate and the shoulders on the underside of each head will engage with the rim of the receptacle to automatically retain the heads in the receptacle and thereby close the latch.

4,133,143

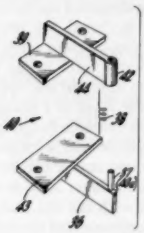
HINGE ARRANGEMENT

Fred M. Campisano, Yorktown Heights, New York, N.Y. 10598

Filed Feb. 4, 1975, Ser. No. 546,896
Int. Cl.[2] E05D 7/08
U.S. Cl. 49—388 1 Claim

1. A hinge for hingedly fastening a first member to a second member permitting relative rotation therebetween about an axis of rotation, said first and second member respectively including first and second contiguous, overlapping parallel planar surfaces orthogonal to said axis of rotation, each of said surfaces having an edge orthogonal to said axis of rotation, said hinge comprising a first part including a first plate member adapted to be fastened to said first planar surface of said first member, and a first arm member attached to said first plate member and extending substantially normally thereto and

outwardly therefrom, an opening being formed near the outwardly extending end of said arm member; said opening being aligned with said axis of rotation; and a second part including a second plate adapted to be fastened to said second planar surface of said second member, a second arm member attached to said second plate and extending substantially perpendicularly thereto and outwardly therefrom and a pin extending upwardly from the outwardly extending end of said arm member and adapted to be rotatively received in said opening, said opening in said first part, said pin of said second part and said axis of rotation being disposed within the area of said overlap and substantially at edges.

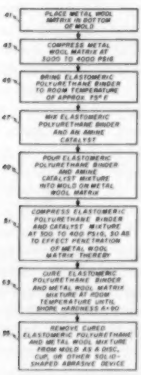


4,133,144

ABRASIVE DISC OF POLYURETHANE BONDED METALLIC WOOL

William E. Early, Orange Park, and Michael G. Linn, Jacksonville, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 16, 1976, Ser. No. 751,308
Int. Cl.[2] B24D *3/06, 3/32*
U.S. Cl. 51—294 **12 Claims**


41
PLACE METAL WOOL MATRIX IN BOTTOM OF MOLD
43
COMPRESS METAL WOOL MATRIX AT 5000 TO 4000 PSIG
45
BRING ELASTOMERIC POLYURETHANE BINDER TO ROOM TEMPERATURE OF APPROX. 75° F
47
MIX ELASTOMERIC POLYURETHANE BINDER AND AN AMINE CATALYST
49
POUR ELASTOMERIC POLYURETHANE BINDER AND AMINE CATALYST MIXTURE INTO MOLD ON METAL WOOL MATRIX
51
COMPRESS ELASTOMERIC POLYURETHANE BINDER AND CATALYST MIXTURE AT 100 TO 400 PSIG, SO AS TO EFFECT PENETRATION OF METAL WOOL MATRIX THEREBY
53
CURE ELASTOMERIC POLYURETHANE BINDER AND METAL WOOL MATRIX MIXTURE AT ROOM TEMPERATURE UNTIL SHORE HARDNESS A-90
55
REMOVE CURED ELASTOMERIC POLYURETHANE AND METAL WOOL MIXTURE FROM MOLD AS A DISC, CUP, OR OTHER SOLID-SHAPED ABRASIVE DEVICE

1. An abrasive tool for removing a predetermined coating from an aluminum surface without damage thereto, consisting of:

an abrasive matrix of metallic wool having a hardness that is slightly less than the aluminum surface from which said predetermined coating is to be removed but greater than that of said predetermined coating to be removed;

a room temperature cured elastomeric polyurethane, two component ether type polyol binder mixed uniformly with said abrasive mixture of metallic wool;

said abrasive matrix of metallic wool and the aforesaid room temperature cured elastomeric polyurethane, two component ether type polyol binder being uniformly mixed in proportions of fifty-five percent and forty-five percent by weight, respectively; and

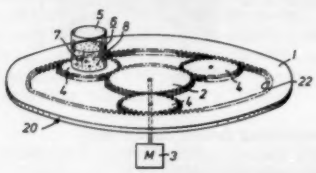
a predetermined amine catalyst mixed with said room temperature cured elastomeric polyurethane, two component ether type polyol binder in such manner as to expeditiously effect the setting thereof after said room temperature cured elastomeric polyurethane, two component ether type polyol binder has been mixed with the aforesaid abrasive matrix of metallic wool and in such manner as to effect a predetermined solid disc thereof upon the setting thereof.

4,133,145

METHOD FOR PRODUCING A GRINDING AGENT CARRIER

Günter Joschko, and Peter Albrecht, both of Berlin, Fed. Rep. of Germany, assignors to TED Bildplatten Aktiengesellschaft AEG-Telefunken-Teldec, Zug, Switzerland

Continuation of Ser. No. 750,634, Dec. 15, 1976, abandoned.
This application Apr. 19, 1977, Ser. No. 788,959
Int. Cl.[2] B24D *11/02*
U.S. Cl. 51—295 **17 Claims**



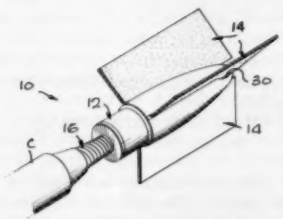
1. In a process for producing a grinding agent carrier comprised of a carrier body and a layer of grinding agent on the surface of the carrier body, the grinding agent layer being initially produced on a planar substrate by sedimentation from a suspension comprised of a suspension medium and grinding agent and then transferred from the substrate and bonded to the carrier body, the improvement wherein the substrate is maintained in a horizontal position and the sedimentation is effected on the horizontal substrate from a liquid column of the suspension wherein the liquid column has a height in millimeters which is at most around 0.4 times the square root of the width in millimeters of the liquid column.

4,133,146

ROTARY ABRASIVE TOOL

Charles R. De Cola, 10913 National Blvd., West Los Angeles, Calif. 90064

Filed Jun. 22, 1977, Ser. No. 808,965
Int. Cl.[2] B24D *13/04*
U.S. Cl. 51—336 **5 Claims**



1. Apparatus for rotating small sheets of abrasive material, comprising:

an elongated hub member rotatable about a predetermined axis and having a plurality of elongated undercut slots radially spaced from but located near said axis and extending along the length direction of said hub member, said hub member having a shaft-engaging first end and a tapered opposite end, and said slots being open at the end

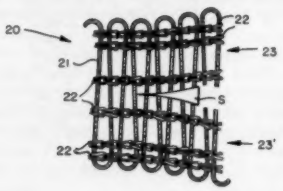
nearest the smallest diameter of the hub to allow an abrasive sheet to extend axially beyond the slot.

4,133,147

ABRASIVE BRUSHES AND METHODS OF MAKING SAME

David J. Swift, Jr., Webster, N.Y., assignor to Schlegel Corporation, Rochester, N.Y.

Filed Aug. 11, 1977, Ser. No. 823,672
Int. Cl.² B24D *13/14*; A46B *3/02*
U.S. Cl. 51—400 **7 Claims**



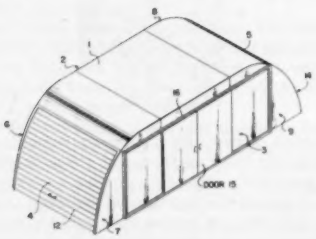
5. An abrasive member comprising
an elastomeric support having therethrough an axial bore and a plane surface on at least one end thereof,
a plurality of abrasive loops secured in said support,
each of said loops being made from at least one synthetic monofilament element containing an abrasive grit distributed substantially uniformly throughout the element, and having at least one generally "U" shaped portion the closed end of which is embedded in said support, said closed ends lying in a common plane adjacent to and generally parallel with said plane surface,
at least one continuous warp yarn embedded in said support and stitched to each leg of each of the embedded "U" shaped portions of said loops, said warp yarn and the loops interconnected thereby being arranged in a spiral path around said bore,
said elastomeric support material being bonded directly both to said warp yarn and to said embedded portions of said loops to provide a firm anchor for the latter,
said support having plane surfaces thereon at opposite ends, respectively, of said bore, and
said loops comprising at least one monofilament element adjacent portions of which are wound back and forth in a zigzag pattern transversely of said spiral path and between said plane surfaces on said support whereby "U" shaped portions of said loops are located adjacent each of said plane surfaces on said support.

4,133,148

ROLL TOP GARAGE

Carrol J. Swenumson, Box 688, Moorcroft, Wyo. 82721

Filed Feb. 1, 1978, Ser. No. 874,042
Int. Cl.² E04B *1/342*; E06B *3/48*
U.S. Cl. 52—64 **3 Claims**



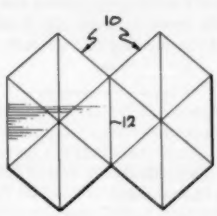
1. A roll top garage, comprising
an enclosure of sheet material having dimensions sufficient to accommodate an automotive vehicle, said enclosure having a pair of spaced substantially parallel sides, a cross-section of substantially square U configuration and spaced opposite first and second ends, each of the first and second ends having an opening dimensioned to pass an automotive vehicle therethrough and bounded by a pair of spaced substantially parallel sides of substantially quadricircular configuration extending from the sides of the enclosure;
first and second guide means each provided at a corresponding one of the first and second ends and mounted on the inside surfaces of the sides thereof; and
first and second roll units each slidable mounted in a corresponding one of the first and second guide means for selectively opening and closing the openings of the first and second ends of the enclosure independently from each other.

4,133,149

FOLDABLE PORTABLE SHELTER

Percy G. Angress, 481 Gayley Ave. #111, Los Angeles, Calif. 90024

Filed Oct. 31, 1977, Ser. No. 847,180
Int. Cl.² E04B *1/343*
U.S. Cl. 52—70 **17 Claims**



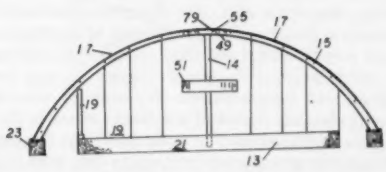
1. A foldable, portable shelter structure which comprises a pair of polygons ranging from hexagons to decagons and formed of a rigid or semi-rigid material disposed in face-to-face relation and secured to each other along at least two contiguous outer edges of said polygons, each of said polygons containing a plurality of fold lines and permitting flexing of the portions of each of said polygons bounded by said fold lines, whereby said polygons can be pulled apart and placed on a flat surface to form a standing shelter structure, and such standing structure can be folded together into a compact substantially planar form.

4,133,150

DOME AND SEMI-DOME-SHAPED STRUCTURE

Joseph Yacoboni, Rte. 5, Box 409, Lake Placid, Fla. 33852

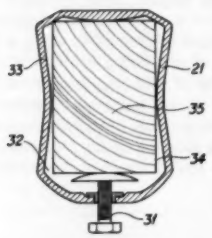
Filed Nov. 14, 1977, Ser. No. 850,950
Int. Cl.² E04B *1/32*
U.S. Cl. 52—80 **6 Claims**



1. A structure having:
(a) a plurality of piers (23) disposed in a substantially semi-annular configuration with a defined diameter;

(b) a central vertical pole roof support (14) at the center of said defined diameter with a defined top portion;
(c) a semi-circular disk-like foundation (13) within and concentric with said semi-annular configuration;
(d) a concave hub (55) disposed over and held by said roof support (14);
(e) a plurality of arcuate ribs (15) having a T-shape cross section, each rib (15) having an elongated arcuate member disposed in one vertical plane under a curved horizontal member in a plane at right angles to said first plane, said ribs extending from each of said piers (23) towards said hub (55), said arcuate member further having an outer end section (50) in the vicinity of said hub (55), a terminal member (49) connected to said hub (55), said terminal member (49) having an elongated rectangular flat configuration of a width corresponding substantially to the width of said arcuate member, said terminal member having an inner end coupling piece (49*a*) bent to lay in a plane alongise said arcuate member so that said terminal member (49) and said arcuate member extend towards hub in the same plane;
(f) a plurality of roof segments (41) supported by said ribs (15) defining a semi-dome with a curved side and a front side; and,
(g) a plurality of flat side panels along said front side extending vertically upwards from said foundation to said defined semi-dome forming an enclosure.

4,133,151
CONNECTING ELEMENT
Sten B. Burvall, Hjärtervägen 7, S-142 00 Trångsund, Sweden
Filed Oct. 3, 1977, Ser. No. 839,052
Claims priority, application Sweden, Oct. 1, 1976, 7610898
Int. Cl.[2] F16B *7/04*
U.S. Cl. 52—93 **5 Claims**

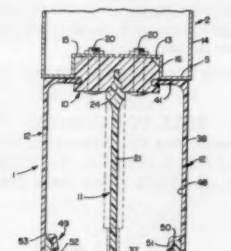


1. In a structural framework of the type comprising a plurality of separate, elongated frame members which are disposed in end to end relation to one another and which are oriented respectively in horizontal, vertical, and oblique directions to define different sections of said framework, the adjacent ends of said frame members being interconnected to one another by connecting elements at a plurality of junctions that are located respectively at the adjacent ends of groups of said frame members, said junction points and their associated connecting elements being disposed in spaced relation to one another throughout said framework, the improvement wherein the connecting elements consist of attachment means in the form of a hollow sleeve surrounding a said frame member and having a transverse cross-section comprising four sides and four corner portions, at least one of said sides being concave, and at least two of said corner portions being convex, said cross-section corresponding to the form generated by the outer contour of the frame member when the frame member within fixed limits is twisted around a predetermined axis of twist.

4,133,152
SET OF TILES FOR COVERING A SURFACE
Roger Penrose, Flat 2, 6 Winchester Rd., Oxford, England
Filed Jun. 24, 1976, Ser. No. 699,326
Claims priority, application United Kingdom, Jun. 25, 1975, 26904/75
Int. Cl.[2] B44F *3/00, 5/00*
U.S. Cl. 52—105 **11 Claims**

1. A set of tiles for covering a plane surface comprising
(a) a plurality of identical tiles of a first shape, five of said tiles assembled together around a center of five-fold symmetry mating along identical lines successively spaced by angles of 72° to produce a basic continuous assemblage without interstices or overlaps, and
(b) a plurality of identical tiles of a second shape different from said first shape said tiles of said second shape mating with tiles both of said first and said second shape to develop said basic continuous assemblage in all directions without interstices or overlaps to produce a greater assemblage of indefinite extent,
said greater assemblage exhibiting localizd features of five-fold symmetry, being non-repeating, and being characterized by the absence of a period parallelogram.

4,133,153
PARTITION RACEWAY
C. Herbert Hage, Poland, Ohio, assignor to GF Business Equipment, Inc., Youngstown, Ohio
Filed Mar. 21, 1977, Ser. No. 779,848
Int. Cl.[2] E04B *5/48*
U.S. Cl. 52—220 **11 Claims**



1. A wiring raceway for a partition assembly including, a partition having outer surfaces and a bottom edge elevated above a supporting surface to provide a clearance therebetween, said raceway including a top mounting member rigidly affixed to said partition bottom edge, said top mounting member of a transverse dimension substantially less than that of said partition and having side surfaces spaced inwardly from said partition outer surfaces and extending downwardly beneath said partition bottom edge, said top mounting member pro-

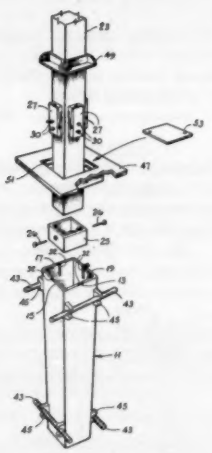
vided with a bottom surface having attachment means medially disposed therein, attachment means on said side surfaces beneath said bottom edge, a framing member having a vertical web connectable to said mounting member and depending therefrom, said web including attachment means on its upper portion mating with said mounting member attachment means to provide releaseable connection therebetween whereby, said framing member is supported in a suspended manner from said mounting member, a bottom wall extending laterally from said vertical web and freely disposed above said supporting surface, a side wall vertically extending from the free end of said bottom wall to define with said bottom wall and said web a wiring channel, a cover having a side wall normally substantially coplanar with one said partition outer surface and including an upper portion extending inwardly beneath said partition bottom edge and provided with attachment means removably engageable with said mounting member side surface attachment means, and said cover includes a lower portion provided with hanger means engageable with said framing member side wall to pivotally support and retain said cover lower portion juxtaposed said framing member side wall whereby, said cover fully encloses said wiring channel from said side wall to said partition bottom edge.

4,133,154

SYSTEM FOR SUPPORTING REMOVABLE POSTS

Otto J. Ruzicka, 261 Iris Way, Palo Alto, Calif. 94303

Filed Oct. 3, 1977, Ser. No. 838,747
Int. Cl.² E02D *27/42*
U.S. Cl. 52—298 **4 Claims**



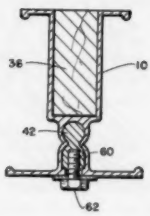
1. A system for supporting a post having any one of a plurality of cross-sectional configurations, the system comprising:
an elongated enclosure having an upper open end and decreasing internal lateral dimensions along the length thereof from said open end;
a post support collar attachable by fasteners to a lower end portion of said post and fully insertable into said enclosure through said open end, said collar being dimensioned to tightly engage the lower interior walls of said enclosure at a position along the length thereof;
a plurality of wedges engaging said post at selected locations about the periphery of the post and engaging the internal walls of said enclosure at the open end of said enclosure, said wedges being selectively movable to adjust the position of said post relative to the walls of said enclosure;
at least two of said pluality of wedges each including two complementary mating portions movable relative to one another to change the external lateral dimension of the wedge;
one of said two complementary mating portions including a threaded longitudinal groove and the other of said complementary mating portions including a longitudinal unthreaded groove, said threaded and unthreaded grooves mating with one another to form a longitudinal bore internally of said wedge; and
a threaded rod disposed in said bore, said rod being rotatable to move the complementary mating portions of said wedge relative to one another, thereby to change the external lateral dimension of said wedge.

4,133,155

JOIST STRUCTURE

Lee D. Oelrich, P.O. Box 3411, Blue Jay, Calif. 92317

Filed Jun. 29, 1977, Ser. No. 811,340
Int. Cl.² E04C *3/292*
U.S. Cl. 52—372 **13 Claims**



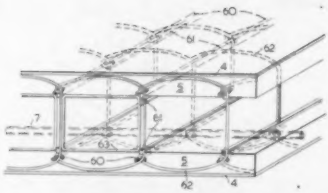
1. Joist for concrete forms and the like comprising:
an elongate beam comprising a pair of outward facing, opposite channels having a common end wall;
one of said channels having a cross-section in the form of a keyhole having a substantially circular upper portion ending in a pair of inwardly extending curved ridges and then extending downward to terminate in a pair of opposite inwardly extending shoulders;
the other of said channels being of rectangular cross-section whereby an elongate wooden nailer may be located in said other channel thereby to provide a mounting surface for nailing a concrete form sheet thereto.

4,133,156

PREFABRICATED WALL FORM AND PRODUCTION METHOD THEREFOR

Heinrich B. Unger, P.O. Box 999, Drayton Valley, Alberta, Canada

Filed Oct. 1, 1976, Ser. No. 728,778
Claims priority, application United Kingdom, Oct. 3, 1975, 40682/75
Int. Cl.² E04B *1/24*
U.S. Cl. 52—383 **6 Claims**



1. A prefabricated wall form adapted to be left in place to provide surfaces after filling said form with a filler, comprising a pair of spaced panels interconnected with a tie-wire mesh structure including a plurality of wire unit members, each wire unit member having a pair of first wires transversely and laterally extending in the panels and a plurality of second wires perpendicular to the first wires and secured thereto, said panels

each consisting of a plural number of layers of different materials and being held in place by said mesh structure, said second wires being alternately bent toward both adjacent wire unit members, the bent portions of the second wires being within the panels and the ends of the bent portions extending at least as far as the first wires of the adjacent wire unit members.

4,133,157

DAMPER FOR SOUND CONDUCTED IN SOLIDS

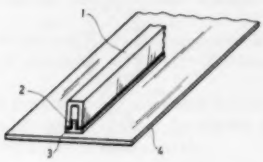
Oskar Bschorr, Munich, and Helmut Albrecht, Weyarn, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Dec. 6, 1976, Ser. No. 747,537

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1975, 2556297

Int. Cl.² E04B *1/98*

U.S. Cl. 52—403 **12 Claims**



1. A sound damper comprising a solid structural member, damping means including a longitudinal damping element arranged alongside and in contact with said structural member, said longitudinal damping element having a high flexural rigidity, and means securing said longitudinal, rigid damping element to said structural member thereby forming a damping unit, said securing means connecting said longitudinal, rigid damping element in a force transmitting manner to the structural member, whereby the damping is accomplished by solid body friction between the structural member and the longitudinal, rigid damping element, said damper further comprising viscous damping means operatively arranged between the structural member and the longitudinal, rigid damping element as well as base means secured to the structural member, said viscous damping means being arranged between said base means and said longitudinal, rigid damping element which is held in position by said base means.

4,133,158

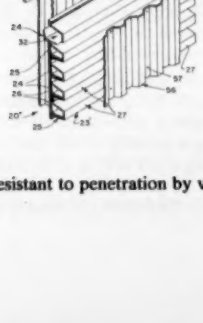
NON-COMPOSITE IMPACT-RESISTANT STRUCTURE

Raymond M. L. Ting, Pittsburgh, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Filed Oct. 7, 1977, Ser. No. 840,404

Int. Cl.² E04B *5/52*

U.S. Cl. 52—478 **13 Claims**



1. A structure resistant to penetration by wind-borne debris including

spaced-apart parallel frame members;

an inner sheath spanning the distance between said parallel frame members, said inner sheath comprising an inner cellular panel formed from

a rectangular flat metal sheet secured to each of said frame members, in outboard relation thereto, and

plural channels disposed outboard of said flat metal sheet and cooperating therewith to form plural parallel inner cells, said channels presenting coplanar inner crests spaced outboard from said flat metal sheet, coplanar inner valleys secured to said flat metal sheet, and inner webs connecting adjacent ones of said inner crests and said inner valleys;

an outer sheath disposed outboard of said inner cellular panel and comprising

corrugated panels having coplanar outer valleys extending transversely of and being secured to said inner crests, outer crests spaced outboard from said inner crests, and outer webs connecting adjacent ones of said outer crests and said outer valleys;

marginal connecting means along the opposite longitudinal sides of said corrugated panels for securing one such panel side-by-side with another such panel;

said corrugated panels cooperating with said inner sheath to provide passageways, each formed by (a) portions of said inner crests extending between adjacent outer valleys, and (b) the overlying outer crest and the adjoining outer webs; and

plural reinforcing elements, one disposed within and extending through each of said passageways, and having a length substantially coextensive with the width of said inner cellular panel;

whereby said reinforcing elements cooperate with said sheath and said outer sheath to provide a combined shear barrier and impact cushion which effectively absorbs the kinetic energy of impacting debris.

4,133,159

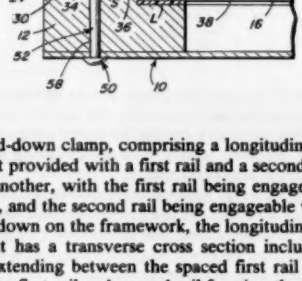
GLAZING HOLD-DOWN CLAMP FOR SOLAR ENERGY COLLECTORS

Cecil O. Nelson, 6324 Parsifal Pl., Las Vegas, Nev. 89107

Filed Aug. 18, 1977, Ser. No. 825,850

Int. Cl.² E04C *2/00*

U.S. Cl. 52—822 **5 Claims**



1. A hold-down clamp, comprising a longitudinally extending element provided with a first rail and a second rail spaced from one another, with the first rail being engageable with a framework, and the second rail being engageable with a sheet to be held-down on the framework, the longitudinally extending element has a transverse cross section including a web arranged extending between the spaced first rail and second rail, with the first rail and second rail forming the limits of the transverse extent of the element, and the web arranged offset from the first rail and second rail and portions of the first rail and second rail in transverse cross section of the element being engageable with the framework and sheet being held-down, the first rail and second rail each have curved abutment surfaces in the transverse cross section, the curved abutment surfaces being arranged for permitting adjustment of the element to varying thicknesses of sheeting to be held-down, the curved abutment surfaces formed in the transverse cross sec-

tion of the element having only point contact with the framework and sheet, with the points lying in a common plane and the web extending at an acute angle from the first rail to the second rail and forming a surface inclined away from the plane of the points of contact of the element, an inclined surface being formed by the web, and at least one wedge-shaped member being mounted on the inclined surface formed by the web and arranged extending only along a small part of the longitudinal extent of the element, the wedge-shaped member being arranged forming a face spaced from the inclined surface, and from the first rail and second rail, which face is oriented substantially parallel to the plane passing through the points of contact of the element with the framework and sheeting.

4,133,160

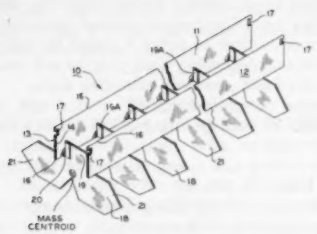
LIGHT REFLECTING AND SHIELDING MODULES FOR SUSPENDED CEILINGS AND ACCESSORIES THEREFOR

Arthur W. Segil, 3611 Commercial, Northbrook, Ill. 60062

Filed Sep. 19, 1977, Ser. No. 834,437

Int. Cl.[2] E04H *12/18*

U.S. Cl. 52—645 **8 Claims**



1. A light reflecting and shielding module for a suspended ceiling or the like, said module being enabled to be shipped in a flattened condition and subsequently erected to an operative position to be supported from a suspended ceiling frame work, said module comprising:

a. a pair of spaced rail members arranged in coplanar relationship and movable by said framework after erection thereof;

b. at least one baffle member hingedly connected to said rail members and extending transversely thereof; and foldable against said rail members when the latter are in coplanar relationship;

c. yieldable hinge means connecting said baffle member to each of said rail members;

d. the centroid of the mass of said baffle member being below the lower extremities of said rail members;

e. said hinge means yielding upon erection of said rail members to operative position so that the centroid of the mass of said baffle causes the same to move to pendent position transversely of said rail members.

4,133,161

PANEL ASSEMBLIES AND METHODS OF FORMING SAME

Allan G. Lester, P.O. Box 23011, Joubert Park, Johannesburg 2001, South Africa

Continuation-in-part of Ser. No. 677,984, Apr. 19, 1976. This application Apr. 25, 1977, Ser. No. 790,570

Claims priority, application South Africa, May 1, 1975, 75/2818; May 25, 1976, 76/3111; Jun. 30, 1976, 76/3911; Apr. 30, 1976, 76/37

Int. Cl.[2] E04B *1/00*

U.S. Cl. 52—748 **13 Claims**

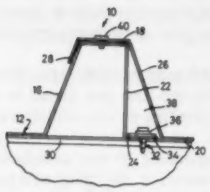
1. A method of covering a structure with a panel assembly comprising:

providing a supporting structure including at least one structural support member;

laying on one side of the supporting structure a first panel which has first and second marginal ridge portions on the opposed extremities thereof and an attachment flange extending from the first marginal ridge portion;

securing the attachment flange of the first panel to said one side of said supporting structure by means of a fastener passing through the attachment flange;

placing a second panel having first and second marginal ridge portions on the opposed extremities thereof in overlapping relationship over the first panel thereby to conceal



by means of the second marginal ridge portion of the second panel the securing of the attachment flange of the first panel to said supporting structure;

passing fastening means through the overlapping first and second marginal ridge portions at locations spaced from said supporting structure and securing said first and second panels against relative movement by means of said fastening means;

providing fixing means depending below said supporting structure and presenting horizontal support surfaces on the side thereof opposite to said one side;

and positioning a covering comprising a plurality of panels in supporting relation on said horizontal support surfaces.

4,133,162

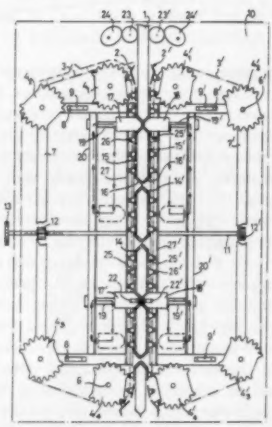
PROCESS AND MEANS FOR PREFORMING CONTAINERS OR CARTONS FROM A TUBE WHICH IS FORMED OF A MATERIAL WHICH CAN BE AUTOMATICALLY WELDED BY PRESSURE

Herbert Baumstingl, Tremelo, Belgium, assignor to Papeteries de Belgique, Brussels, Belgium

Continuation-in-part of Ser. No. 669,678, Mar. 23, 1976, abandoned. This application Sep. 2, 1977, Ser. No. 830,039

Int. Cl.[2] B65B *9/12*

U.S. Cl. 53—450 **11 Claims**



1. A method of preforming containers from a tube contain-

ing a liquid and constructed of a material which can be welded by presure, comprising the steps of:

(a) advancing a filled tube downward between two endless trains of opposite half-moulds;

(b) moving said trains of half-moulds around predetermined paths so that opposite counterpart portions of the moulds simultaneously approach and progressively engage the walls of the tube to shape a series of containers to be formed, with the end portions of adjacent half-moulds defining together transverse welding seats between each set of half-moulds at the junctions between the containers;

(c) compressing and welding transverse portions of the tube with a first opposite jaw means during descent of the half-moulds at alternate welding seats to form welded seams defining tube sections corresponding to two containers;

(d) separating said sections of the tube through the welded seams made by the first jaw means to disconnect each section corresponding to two containers;

(e) compressing and welding transverse portions of each section corresponding to two containers with a second opposite jaw means at the other alternate welding seats during descent of the half-moulds to divide said sections into pairs of containers connected by intermediate welded seams;

(f) separating each pair of containers through the intermediate welded seams made by the second jaw means to disconnect the individual preformed containers; and

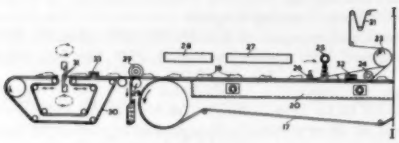
(g) moving said trains of opposite half-moulds around predetermined paths so that opposite counterpart portions thereof simultaneously withdraw and progressively disengage the individual preformed containers.

4,133,163

PACKAGING MACHINES

Peter G. Wilson, Leeds, England, assignor to Baker Perkins Holdings Limited, Peterborough, England

Filed Jun. 3, 1977, Ser. No. 803,377
Int. Cl.[2] B65B *31/02, 11/52*
U.S. Cl. 53—52 **7 Claims**



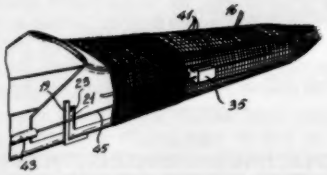
1. A skin packaging machine for the continuous production of air-free skin packages comprising a suction box, a perforated conveyor for traversing over the suction box an imperforate lower web of thermoplastic material carrying spaced articles to be packaged, means for feeding an imperforate upper web of thermoplastic material towards the lower web, means for guiding the edges of the upper web into contact with the upper surface of the lower web as the latter travels over the suction box, means for heating said upper web prior to contact thereof with said lower web, a clamp disposed above said suction box, said clamp being operative periodically to press said webs between said articles, and a thermoforming unit, disposed between a supply reel for the lower web and the conveyor, which is operative to impose a dimpled upper surface on the lower web, said thermoforming unit being constituted by a heated drum and an adjoining thermoforming drum around both of which the lower web is passed, and the thermoforming drum having an air-permeable and dimpled peripheral surface and including means for applying suction to the interior thereof.

4,133,164

SPLIT HORN ARRANGEMENT

Marcus Mintz, Chomedey, Canada, assignor to Industrial Knitting, Inc., St. Lawrence, Canada

Filed Sep. 28, 1977, Ser. No. 837,439
Int. Cl.[2] B65B *39/02*
U.S. Cl. 53—261 **7 Claims**



1. A split horn arrangement for packaging a product into a stretchable casing material, said arrangement having a front end and a back end, and comprising:

an elongated lower member having upwardly extending side walls on both sides thereof;

an elongated upper member having depending side walls on both sides thereof, said upper member being disposed over said lower member to define a tunnel therebetween and such that said depending walls overlap and cover respective ones of said upwardly extending walls;

guide means permitting guided upward and downward movement of said upper member relative to said lower member; and

means for loading said casing material on said arrangement at said front end thereof;

characterized in that said casing material comprises a netting having a plurality of lateral threads;

said arrangement further comprising:

an elongated rail extending longitudinally on each of said depending side walls;

a pulling means for engaging each of said rails to be guided by its respective rail, and including means for graspingly engaging respective lateral threads, said pulling means being movable along the length of said split horn arrangement;

whereby, when the pulling means grasps said lateral threads and is moved from said front end in the direction of said back end of said arrangement, said netting is pulled from said front end in the direction of said back end of said arrangement.

4,133,165

FORAGE HARVESTER THROAT SHEETS

Manfried L. Hoch, Romeoville, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Jun. 17, 1977, Ser. No. 807,708
Int. Cl.[2] A01D *89/00*
U.S. Cl. 56—2 **4 Claims**

1. A forage harvester comprising:

a basic processing unit including:

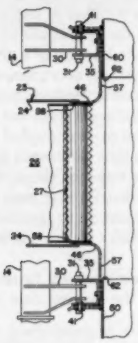
a mobile frame;

a crop processing unit mounted on said frame including a cutterhead disposed for rotation about a transverse axis and a plurality of opposed transversely elongated crop infeed rolls disposed forwardly thereof and defining a crop feeding passage therebetween;

a feed roll housing including transversely spaced fore-and-aft extending sidewalls disposed adjacent the respective ends of said feed rolls, said side walls terminating at a forwardly facing crop receiving opening; and

a pair of shield members mounted on said basic processing unit for fore-and-aft swinging movement relative to said feed roll housing and disposed adjacent said forwardly facing opening respectively on each side thereof, said

shield members having an upward extent at least equal to said crop feeding passage, said shields extending laterally outwardly from rearwardly turned inner ends disposed inwardly adjacent said sidewalls to outward ends substantially spaced from the side walls;



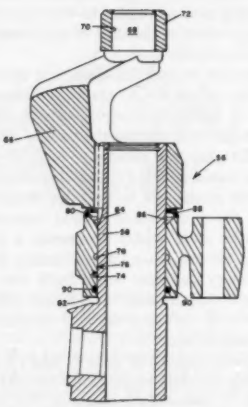
and a crop feeding unit detachably mounted to said basic unit forwardly of said shields and in confronting relationship thereto, said crop unit having a rear crop discharge opening having a transverse width greater than that of said infeed housing opening.

4,133,166

COTTON PICKER BAR LUBRICANT SEAL

Arthur L. Hubbard, Des Moines, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Mar. 2, 1977, Ser. No. 773,756
Int. Cl.[2] A01O *46/18*
U.S. Cl. 56—44 **3 Claims**



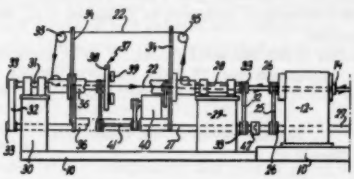
1. In a cotton picker drum having an upper horizontal drum head rotatable about a vertical axis and having a plurality of angularly spaced vertical cylindrical openings adjacent its periphery, said drum further having a plurality of upright picker bars, one for each cylindrical opening, and having upper cylindrical shaped ends extending through and journaled in said openings, and an inlet for introducing lubricant under pressure between the walls of the aforesaid cylindrical ends and the walls forming the cylindrical openings, the improvement residing in means for sealing and retaining lubricant between the walls of each of said ends and said openings, comprising: an annular opening below the inlet and in the wall of the cylindrical opening; an annular seal seated in the opening and engaging the wall of the cylindrical shaped end for preventing movement of lubricant therebelow; an upper flexible and annular sealing member above the drum head having an annular inner edge bearing against the upper end of the picker bar with sufficient pressure to cause the seal to rotate with the picker bar, and extending from the edge first radially and then downwardly to an annular surface that bears in sealing relation against the upper surface of the drum head to provide above the drum head a lubricant chamber for receiving lubricant forced upwardly from the inlet.

4,133,167

CABLE MAKING MACHINES

Richard W. Schofield, Hawkshaw, near Bury, England, assignor to The General Engineering Co. (Radcliffe) Limited, Radcliffe, England

Filed Jun. 9, 1977, Ser. No. 805,115
Claims priority, application United Kingdom, Jun. 10, 1976, 24003/76
Int. Cl.[2] D01H *7/86, 1/28*
U.S. Cl. 57—12 **7 Claims**



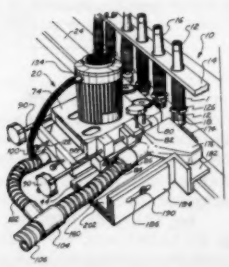
1. A twisting and lapping machine for filamentary material, there being a first cradle means for carrying at least a take-up device for the filamentary material, and around which is rotatable a twister bow, and a second cradle means spaced from the first cradle means and substantially in axial alignment therewith for carrying at least one means for lapping and around which is rotatable a filamentary material, common drive means for driving the twister bow and means for lapping, means for disconnecting the drive to the means for lapping when required, guide means for guiding the filamentary material, and there being filamentary material diverter means between the first and second cradle means for guiding the filamentary material either directly to the take-up device or to the means for lapping and then the take-up device.

4,133,168

APPARATUS FOR REMOVING YARN WRAPS FROM SPINDLES

Alex J. Keller, Jr., and Eddie R. Best, both of Gastonia, N.C., assignors to Automatic Material Handling, Inc., Bessemer City, N.C.

Filed Feb. 21, 1978, Ser. No. 879,904
Int. Cl.[2] D01H *11/00*
U.S. Cl. 57—304 **17 Claims**



1. Apparatus for removing underwound wraps of yarn from

a row of rotatable spindles on a textile yarn spinning machine comprising:

(a) carrier means arranged for movement along said row of spindles,

(b) a plurality of rotatable yarn stripping members disposed for engagement with said spindle to remove said underwound wraps of yarn therefrom,

(c) separate mounting means for each of said yarn stripping members, each of said mounting means being arranged for independent movement with respect to said carrier means toward and away from said row of spindles in a direction generally perpendicular to the direction of movement of said carrier means along said row of spindles;

(d) biasing means for urging each said mounting means in said direction toward said spindle; and

(e) driving means for positively rotating said plurality of yarn stripping members,

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4,133,169

ELECTRONIC CIRCUIT FOR A QUARTZ CRYSTAL WATCH

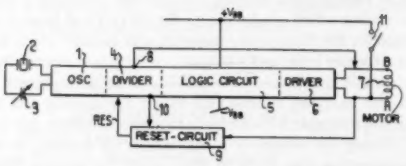
Igor Scherrer, Colombier, and Pierre Hersberger, Neuchatel, both of Switzerland, assignors to Ebauches S.A., Neuchatel, Switzerland

Continuation of Ser. No. 600,869, Jul. 31, 1975, abandoned. This application Apr. 19, 1977, Ser. No. 788,754

Claims priority, application Switzerland, Aug. 30, 1974, 11818/74

Int. Cl.[2] **G04B** *27/08;* **G04C** *3/00*

U.S. Cl. 58—23 R **4 Claims**



1. An electronic timepiece comprising a quartz crystal, a power supply having two output terminals, a stepping motor having two feeding terminals and an integrated circuit having terminals, said power supply terminals connected to said integrated circuit, said integrated circuit comprising:

an oscillator circuit coupled to said crystal for delivering on its output a first signal of a first frequency:

a multistage divider connected to said oscillator output for delivering on at least a first output a second signal of a second frequency;

a control stage connected to the first output of the divider for applying driving current pulses to the feeding terminals of the motor through a first and second of said integrated circuit terminals; and

circuit means for performing at least one auxiliary function, directly connected to said first integrated circuit terminal, whereby no supplementary terminal is needed on said integrated circuit for connecting said circuit means.

4,133,170

GLOBAL TIMEPIECE

Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 681,068, Apr. 28, 1976, abandoned. This application Nov. 23, 1977, Ser. No. 854,052

Claims priority, application Japan, Apr. 30, 1975, 50-52366

Int. Cl.[2] **G04B** *19/22*

U.S. Cl. 58—42.5 **10 Claims**

1. A global timepiece comprising: '(a) a source of clock pulse signals;

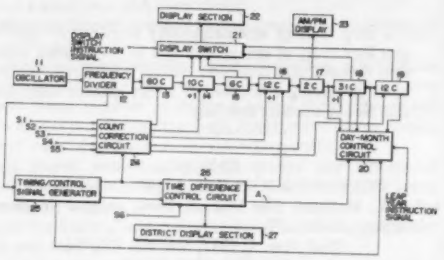
(b) a counter circuit coupled to said clock pulse signal source and responsive to said clock pulse signals, said counter circuit including at least a time-counting circuit for electronically counting the time of the day of a basic district, a day-counting circuit for electronically counting days of said basic district, and a month-counting circuit for electronically counting months of said basic district;

(c) control means coupled to said counter circuit and responsive at least to the day count of said day-counting circuit for switching the last day of a given month to the first day of the next month in accordance with the calendar;

(d) designating means for designating a district which has a time which is different from the time of said basic district;

(e) time correction means coupled to said designating means for supplying a time difference signal representative of the time difference between times of the basic district and of the designated district to at least said time-counting circuit of said counter circuit to thereby change the current time of the basic district to the current time of the designated district;

(f) detector means coupled to said designating means for detecting that the current date of said designated district



precedes the current date of said basic district and for producing a detection output responsive to said detection;

(g) day-detecting means coupled to said day-counting circuit for detecting whether the date of said basic district is the first day of a month;

(h) means coupled to said day-detecting means and to said day-counting circuit for subtracting a count of "1" from the count of said day-counting circuit when said day-detecting means detects that the date of said basic district is not the first day of a month;

(i) converting means coupled to said day-detecting means, to said detector means and to said day-counting circuit for converting the count value of said day-counting circuit into a specific code which represents a notation which differs from the notations corresponding to the numerals on the ordinary calendar when both said day-detecting means detects that the date of said basic district is the first day of a month and said detector means produces said detection output; and

(j) display means coupled at least to said converting means for indicating the data represented by said specific code.

4,133,171

TEMPERATURE STRATIFIED TURBINE COMPRESSORS

Ernest R. Earnest, Hobe Sound, and Bill Passinos, North Palm Beach, both of Fla., assignors to Hydragon Corporation, Lake Park, Fla.

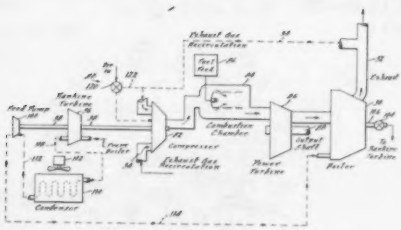
Filed Mar. 7, 1977, Ser. No. 774,905

Int. Cl.[2] **F02C** *7/00, 7/08*

U.S. Cl. 60—39.18 B **6 Claims**

1. An integrated Brayton cycle-Rankine cycle engine comprising a Rankine turbine and a high pressure ratio, single stage rotary compressor driven thereby, said Brayton cycle using ambient air and combustion products as its working fluid, said compressor having a hub and a plurality of blades extending

therefrom, a Brayton turbine and an intercycle heat exchanger heated by the exhaust of the Brayton turbine and delivering heat to the Rankine fluid for powering the Rankine turbine, and a burner and air supply assembly for delivering air from the compressor and products of combustion from the burner to the Brayton turbine, recirculation means for recirculating a portion of the exhaust gases from the Brayton turbine into the



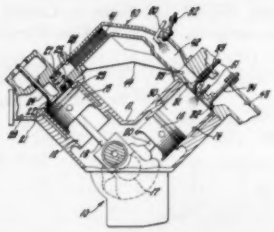
compressor, said exhaust gases being at a higher temperature than said ambient air, and a compressor inlet duct having a peripheral inlet opening communicating with said recirculation means and a central inlet opening communicating with said ambient air, whereby said recirculated exhaust gases and said ambient air are introduced into said compressor as stratified gas streams and the local relative Mach number of the fluid velocity is reduced at the tips of the compressor blades.

4,133,172

MODIFIED ERICSSON CYCLE ENGINE

Roy S. Cataldo, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 3, 1977, Ser. No. 821,576
Int. Cl.[2] F02B *41/02, 53/08*
U.S. Cl. 60—39.63 **4 Claims**



1. An engine adapted to operate on a modified Ericsson cycle, said engine including an engine block having a first cylinder bank and a second cylinder bank angularly disposed relative to said first cylinder bank and mounting a crankshaft, at least one compressor cylinder in said first cylinder bank and at least one expander cylinder in said second cylinder bank, a compressor piston reciprocally disposed in said compressor cylinder to define therewith a variable volume compression chamber and an expander piston reciprocally disposed in said expander cylinder to define therewith a variable volume expansion chamber, said compressor piston and said expander piston each being operatively connected to said crankshaft, said compressor cylinder and said expander cylinder each having inlet passages and outlet passages and valves positioned therein for controlling the ingress and egress of fluid therethrough, said inlet passage of said compressor cylinder being operatively connected to a source of air, an exhaust heat recuperator and a combustor having a constant volume combustion chamber therein connected in series with said combustion chamber being in fluid communication with said inlet passage of said expander cylinder, said exhaust heat recuperator having first passage means connected at one end to the outlet passage of said compressor cylinder and at its other end in fluid communication with said combustion chamber and a second passage means having one end connected to the outlet passage of said expander cylinder and its other end opening for communication to the atmosphere, said second passage means being in heat exchange relationship with said first passage means, ignition means and a first fuel supply means operatively associated with said combustion chamber and a second fuel supply means operatively associated with said expander cylinder, said pistons, said valves, said first fuel supply means, said second fuel supply means and said ignition means being operatively related through said crankshaft to cause said engine to perform an operating cycle including the steps of:

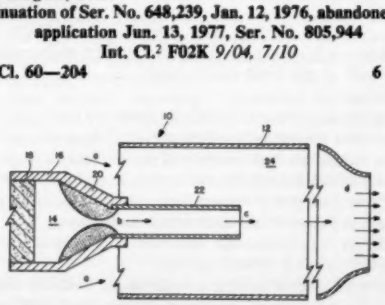
a. admission of air to the compressor cylinder during the intake stroke of said compressor piston,
b. substantial adiabatic compression of the air in said compressor cylinder during the compression stroke of said compressor piston,
c. transfer of the compressed air through said outlet passage of said compressor cylinder to said first passage means in said exhaust heat recuperator so that the compressed air is then heated by exhaust gases flowing through said second passage means of said exhaust heat recuperator,
d. transfer of the compressed and heated air to said combustion chamber,
e. admission of sufficient fuel through said first fuel supply means with ignition and burning thereof so that heat is added at constant pressure to the fluid in said combustion chamber,
f. transfer of the compressed and heated gases from said combustion chamber to said expander cylinder during opening of said valve controlling flow through said inlet passage to said expander cylinder,
g. admission of additional fuel by said second fuel supply means and combustion thereof during the expansion stroke of said expander piston in said expansion cylinder at constant temperature with a resultant output of work to said crankshaft, and
h. exhaust of the spent gases from said expansion cylinder through said second passage means of said exhaust heat recuperator to the atmosphere.

4,133,173

DUCTED ROCKETS

Klaus C. Schadow, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 648,239, Jan. 12, 1976, abandoned. This application Jun. 13, 1977, Ser. No. 805,944
Int. Cl.[2] F02K *9/04, 7/10*
U.S. Cl. 60—204 **6 Claims**



1. The method of improving efficiency of rocket engines having a primary and a secondary combustion chamber including the step of:

burning a solid propellant in a primary chamber to produce combustion products;
placing a nozzle at the open end of the primary chamber through which the combustion products of the primary chamber must flow;
maintaining a supersonic flow of the combustion products through the nozzle;

slowing the supersonic flow to subsonic after it has passed through the nozzle, but prior to its entrance in the secondary chamber;

restricting the subsonic flow so that it travels parallel to the secondary chamber axis when it enters the secondary chamber; and

restricting the flow of ram air as it enters the secondary chamber so that it travels parallel to the secondary chamber axis, so that it limits the mixing process between the ram air and combustion products to one of diffusion only.

4,133,174

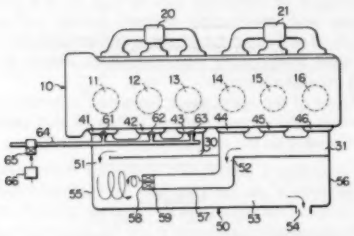
METHOD OF REDUCING POLLUTANTS IN ENGINE EXHAUST GAS BEFORE EMISSION INTO THE ATMOSPHERE

Kenji Masaki, Yokohama, Japan, assignor to Nissan Motor Company, Ltd., Japan

Continuation of Ser. No. 521,197, Nov. 5, 1974, abandoned. This application Dec. 7, 1976, Ser. No. 748,174

Int. Cl.² F01N *3/10*

U.S. Cl. 60—285 **10 Claims**



1. An engine system including an internal combustion engine having an even number of combustion chambers of the same construction and function said combustion chambers being divided into a first group and a second group, each consisting of one half of the total combustions chambers, said system comprising:

means for supplying a first air-fuel mixture having an air/fuel ratio substantially below the stoichiometric ratio and the second air-fuel mixture of an air/fuel ratio substantially above the stoichiomtric ratio to said first group and said second group respectively simultaneously in predetermined sequential order within each group;

means for simultaneously selectively igniting a predetermined chamber of each group;

a thermal reactor having a cylindrical reaction chamber having inlet means including at least one inlet and an outlet, said outlet disposed at essentially the other end of said chamber from at least one said inlet, said inlet means simultaneously admitting exhaust gases from each group of said combustion chambers;

a first exhaust manifold through which said first group of combustion chambers communicate with said inlet means of said thermal reactor;

means for introducing secondary air into said first exhaust manifold when the engine load falls below a predetermined value.

4,133,175

INTERNAL COMBUSTION ENGINE EQUIPPED WITH IMPROVED SECONDARY AIR SUPPLY SYSTEM

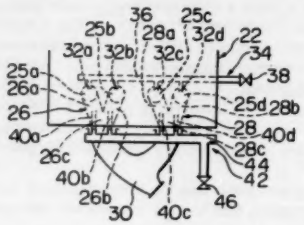
Kazumasa Katoh, Yokohama, Japan, assignor to Nissan Motor Company, Ltd., Japan

Filed Feb. 24, 1977, Ser. No. 771,662

Claims priority, application Japan, Feb. 26, 1976, 51-21089

Int. Cl.² F01N *3/10*

U.S. Cl. 60—293 **10 Claims**



1. An internal combustion engine comprising:

a cylinder head defining two combustion chambers, said cylinder head being formed with an exhaust port which has two upstream portions which are respectively connectable to the two combustion chambers, and a downstream portion connected to the two upstream portions and open to one side of said cylinder head;

a first secondary air supply means for supplying air to the two upstream portions of the exhaust port; and

a second secondary air supply means for supplying air to the exhaust port, said second secondary air supply means being different and separate from said first secondary air supply means.

4,133,176

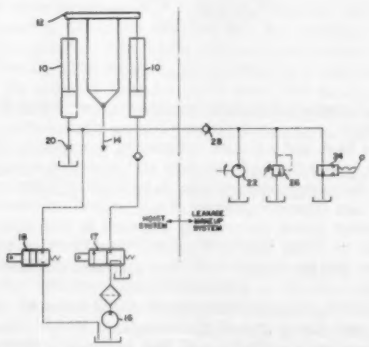
APPARATUS AND METHOD FOR HYDRAULIC MAKEUP AND CONTROL

Duane K. Russell, Everett, and James L. Cordell, Snohomish, both of Wash., assignors to Western Gear Corporation, Everett, Wash.

Filed May 18, 1977, Ser. No. 797,905

Int. Cl.² F16D *31/00*

U.S. Cl. 60—327 **2 Claims**



1. The method of holding a constant pulling load on a drill pipe with an hydraulic driling rig, comprising;

connecting a set of hydraulic cylinders to the drill pipe,

pumping a large capacity primary flow of an hydraulic fluid to the cylinders for positioning the pipe,

halting the primary flow of fluid to positively hold the pipe, and

pumping a smaller capacity makeup hydraulic fluid to the cylinders for replenishing primary fluid lost by leakage

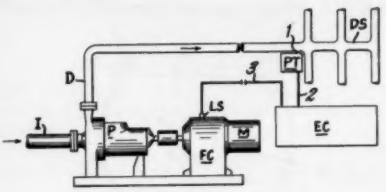
while the flow is halted whereby the pipe can be accurately held in a stationary position.

4,133,177

VARIABLE FILL FLUID COUPLING CONTROL MEANS

Nelson H. Wilson, Brownsburg, Ind., assignor to Indian Head Inc., New York, N.Y.

Filed Dec. 27, 1977, Ser. No. 864,760
Int. Cl.[2] F16D *33/06*
U.S. Cl. 60—358 **2 Claims**



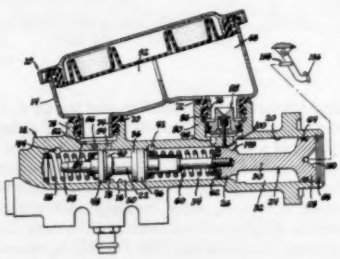
1. In a combination comprising (a) a variable fill fluid coupling for coupling a constant speed drive motor to a driven centrifugal pump having a discharge conduit, said fluid coupling having a compression spring-loaded pivotal charging stream splitter assembly, and (b) a control means for controlling the movement of the splitter assembly responsive to pressure change in said discharge conduit, the improvement wherein the control means comprises (b_1) a pressure transducer connected to said discharge conduit for sensing a pressure change in the discharge conduit and converting said sensed pressure change into an electrical input signal, (b_2) an electrical controller connected to said pressure transducer for receiving said electrical input signal and providing a responsive electrical output signal and (b_3) an electro-proportional linear solenoid connected, on the one hand, to said electrical controller for receiving and responding to said electrical output signal and operatively engageable, on the other hand, with said splitter assembly.

4,133,178

QUICK TAKE-UP MASTER CYLINDER

Frank W. Brooks, Sr., Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 18, 1977, Ser. No. 788,627
Int. Cl.[2] B60T *11/08;* **F15B** *7/04*
U.S. Cl. 60—578 **4 Claims**



1. In a quick take-up master cylinder having a fluid reservoir, a stepped bore, first and second compensation ports connected to said stepped bore, and a mating stepped piston reciprocably received in said bore, said piston and said bore defining a large diameter quick take-up pressurizing first chamber incontinuous fluid communication with said first compensation port; and a smaller diameter high pressure pressurizing second chamber, a compensation control and blow-off valve unit comprising:

a first valve permitting fluid flow therepast from said reservoir through said first compensation port and to said first chamber and preventing fluid flow therepast in the reverse direction;

a second valve having yieldable means continually urging said second valve closed, said second valve having one side exposed to fluid in said reservoir and another side exposed to fluid in said bore;

and means for opening said second valve against the urging of said yieldable means and including a cam surface on said piston and a valve pin engageable with said cam surface, said cam surface engaging said pin to hold said second valve open when said piston is in the master cylinder fully released position and disengaging said pin to permit said yieldable means to close said second valve when said piston is moved in said bore away from the master cylinder fully released position to a pressurizing position;

said second valve opening means further including an area of said second valve on said another side continuously exposed to fluid in said first chamber and responsive to a predetermined pressure differential between a higher fluid pressure generated in said first chamber during master cylinder actuation and the lower fluid pressure of said reservoir to open said second valve against the urging of said yieldable means to relieve pressure in said first chamber independently of action of said valve pin and cam surface;

whereby pressure generated in said first chamber during master cylinder actuation is limited so that the master cylinder actuating force is not required to overcome pressure generated in said first chamber beyond that to provide quick take-up.

4. In a quick take-up master cylinder having a fluid reservoir, a master cylinder body with a stepped bore formed therein, and a mating stepped piston received in said bore and actuatable therein in apply and release modes, said bore and said piston defining a large diameter quick take-up pressurizing chamber and a smaller diameter high pressure pressurizing chamber, an improved compensation control and blow-off unit operable during the apply mode of said piston to selectively vent said quick take-up pressurizing chamber and comprising:

a valve chamber formed in said master cylinder body with a side wall and a bottom surface and a top opening into said reservoir, said bottom surface having first and second compensation ports extending therethrough and into said bore, said first compensation port being continually connected with said quick take-up pressurizing chamber and said second compensation port being connected with said high pressure pressurizing chamber when said piston is in the fully released position of said release mode, and a third port extending from said bore through said bottom surface into said valve chamber;

a valve assembly including a valve body having a lip type compensating seal extending about the outer periphery thereof and in sealing contact with said valve chamber side wall to permit fluid flow in one direction only, said valve body including means permitting fluid to pass in said one direction from said reservoir past said compensating seal to said compensation ports and said quick take-up pressurizing chamber as said piston is actuated in said release mode to said fully released position thereof;

said valve body having a passage extending axially therethrough and connecting said reservoir and the portion of said valve chamber between said valve body and said valve chamber bottom surface and having a check valve therein which when closed prevents flow from said reservoir through said passage to said compensation ports when said piston is in either apply or release modes;

and a pin having one portion extending through said third port into said bore for engaging said piston and another portion acting on said check valve to open or close said check valve in response to actuation of said piston, said piston having a cam surface engageable with said one pin

portion to open said check valve when said piston approaches said fully release position of said release mode to permit fluid to pass from said high pressure pressurizing chamber to said reservoir through said passage, the cam surface of said piston disengaging from said one pin portion when said piston is initially actuated from said fully released position in said apply mode to permit closure of said check valve to retain fluid in said quick take-up pressurizing chamber, said check valve opening in response to a predetermined blow-off pressure generated in said quick take-up pressurizing chamber during further actuation of said piston from said fully released position in said apply mode to vent said quick take-up pressurizing chamber to said reservoir irrespective of engagement or disengagement of said one pin portion with said piston.

4,133,179

SOIL STABILIZING METHOD USING AIR BUBBLED SOLIDIFYING SUSPENSION

Kenji Kawasaki; Shigeyoshi Miura; Yoshio Minamikawa, and Akira Ohashi, all of Osaka, Japan, assignors to Konoike Construction Co., Ltd., Osaka, Japan

Filed Aug. 16, 1977, Ser. No. 825,134
Claims priority, application Japan, Sep. 2, 1976, 51/105592
Int. Cl.[2] E02D *3/14*
U.S. Cl. 405—263 **4 Claims**

1. In a method of solidifying the soil by injecting into the soil an aqueous suspension of an organic or inorganic solidifying agent, conventionally used to solidify the soil, under air pressure by means of an injection pipe underneath the soil, the improvement which comprises (1) preparing a suspension of an organic or inorganic solidifying agent by first mixing a foaming agent with water and stirring to initially produce an aqueous mixture containing a large quantity of air bubbles; adding an organic or inorganic solidifying agent thereto and then kneading the mixture to produce a suspension containing air bubbles in an amount of 20–70%, a large quantity of said air bubbles being of microscopic size and (2) then injecting this suspension through said injection pipe into the soil at a high pressure of at least 200 Kg/cm^2 by means of a high pressure pump to homogeneously solidify the soil over a wide area.

4,133,180

APPARATUS FOR WELDING SUBMERGED PIPE ENDS

Philippe C. Nobileau, Neuilly sur Seine; Rene M. Dermy, Courcouronnes, and Guy J. Fleury, Paris, all of France, assignors to Compagnie Francaise des Petroles, Paris; Etudes Petrolieres Marines, Paris; Ateliers et Chantiers de Bretagne-A.C.B., Nantes; Compagnie Maritime d'Expertises, Marseille; Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines (Doris), Paris and Societe Nationale Elf Aquitaine (Production), Courbevoie, all of, France

Filed Jun. 28, 1976, Ser. No. 700,680
Claims priority, application France, Jul. 2, 1975, 75 20785
Int. Cl.[2] B63C *11/00*
U.S. Cl. 405—170 **10 Claims**

1. A device for connecting by welding, the ends of two equal diameter, submerged pipes, said device comprising:

a structure for displacing and aligning submerged pipes,

an open, first receptacle having a wall providing an opening for sealed connection to a submarine intervention unit,

a submarine intervention unit comprising a sealed, second receptacle having an opening therein in sealed connection to the opening within said first receptacle,

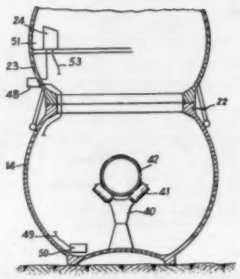
opposed axially aligned orifices within said first receptacle, each orifice having a diameter greater than the external diameter of the pipes to be connected,

means for mounting said first receptacle on said structure for displacement relative to said submerged pipes on opposite sides of said first receptacle and in alignment with said orifices,

sealing means arranged around said orifices for sealing between the external surfaces of the pipes and said first receptacle,

a support within said first receptacle,

and a connection sleeve resting on said support in axial alignment with said orifices with one of the ends of said sleeve being sized equal to that of said pipes and the other end of said sleeve having an internal diameter slightly greater than the external diameter of the pipes so as to telescopically receive one of said pipes during displacement of said receptacle on said structure relative to said one pipe and passage of said one pipe through a corresponding orifice which receives the same, such that by connection of said submarine intervention unit to said receptacle in a water tight manner, the water can be evacuated from said receptacle and replaced with air at atmospheric pressure to facilitate welding of said one pipe to the end of said sleeve telescopically receiving said one pipe and the other of said pipes at its abutment to the other end of the sleeve having the same diameter thereto.



4,133,181

METHOD OF ASSEMBLING AND LAYING A CONDUIT FOR CONVEYING A FLUID BETWEEN AN ON-SHORE POINT OF A COASTAL REGION AND AN ADVANCED OFF-SHORE POINT

Michel Kotcharian, Paris, France, assignor to Technigaz, France

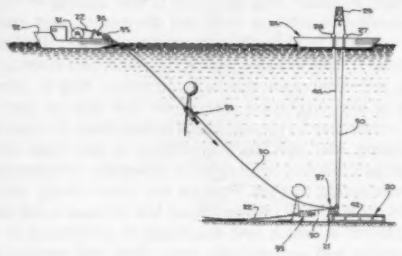
Filed Mar. 30, 1976, Ser. No. 671,952
Claims priority, application France, May 7, 1975, 75 14376
Int. Cl.[2] F16L *1/00, 1/04*
U.S. Cl. 405—159 **9 Claims**

1. Method intended for assembling and laying at least three fluid conveying conduits in parallel relationship, between an on-shore point of a coastal region and an advanced off-shore point, comprising the steps of erecting on the bottom of the sea, at substantially regular intervals, partially emersed pillars, prefabricating before or after erecting said pillars conduit sections having lengths corresponding to the intervals between the said pillars, mounting the said sections between and supporting the same at least partially on successive pillars, and interconnecting said sections above the level of the sea, and including the steps of assembling sections of the three conduits in bunch arrangement in such a manner that the mechanical strength of each bunch thus formed is greater than that of one of the conduit sections, suspending the said bunches between the said pillars, the latter being spaced from one another at a distance greater than that required for one of the conduit sections and corresponding to the said increased mechanical strength, and connecting the successive conduit sections of said bunches respectively to one another.

4,133,182
APPARATUS AND METHOD OF CONNECTING A FLOWLINE TO A SUBSEA STATION

Georges M. Chateau, Pau, France, assignor to Societe Nationale Elf Aquitaine (Production), France

Filed Jan. 13, 1977, Ser. No. 759,030
Int. Cl.² F16L 1/04
U.S. Cl. 405—169 7 Claims

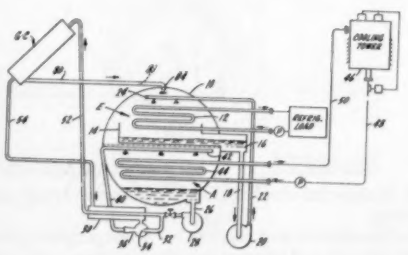


1. A flowline connector means for a pipe at a subsea station for a flowline laid on the sea floor; comprising:
- an elongated connector receptacle supported by the subsea station and having its axis directed toward the approach of the flowline;
- an elongated connector mandrel on a proximate end of the flowline;
- pulling means including a cable having a connection to said flowline behind said mandrel,
- said pulling means being positionable above and adjacent said receptacle for pulling said mandrel along a path coincident with the axis of the receptacle and toward and into said receptacle,
- said pulling means including a cable guide member having a guide path parallel to and above said receptacle;
- and means on said receptacle cooperable with means on said mandrel for locking said mandrel in a selected longitudinal position relative to the receptacle with a mandrel end projecting beyond said receptacle for connection in said position to a pipe on said subsea station.

4,133,183
SOLAR POWERED ABSORPTION REFRIGERATION SYSTEM

Clarence E. Albertson, Villa Park, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 29, 1976, Ser. No. 755,328
Int. Cl.² F25B 27/00, 15/00
U.S. Cl. 62—2 8 Claims

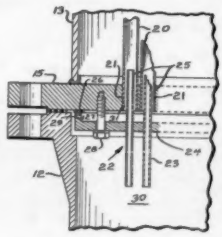


1. An absorption refrigeration system comprising: an evaporator; an absorber; a generator and a condenser all connected in a closed, continuous cycle refrigeration circuit with relatively concentrated absorbent solution flowing to the absorber to absorb water vapor from the evaporator and relatively dilute absorbent solution flowing from the absorber to the generator to be concentrated with concomitant release of water vapor to be conducted to the condenser, said generator and condenser being combined in a housing which includes a solar collector for providing thermal energy to the absorbent solution to be concentrated, said solar collector including a series of inclined troughs into which said relatively dilute solution is introduced, said troughs being provided with a solar absorbing surface; an air-cooled condenser section in said housing including means defining a vapor condensing surface subjacent said troughs; and means for conducting condensed vapor to said evaporator.

4,133,184
METHOD OF FLOW STABILIZATION IN A TUBE AND SHELL VAPORIZER

Henry W. Bivins, Jr., 5030 Brummel, Skokie, Ill. 60076

Division of Ser. No. 676,054, Apr. 12, 1976, Pat. No. 4,083,707.
This application Mar. 2, 1977, Ser. No. 773,506
Int. Cl.² F17C 7/02
U.S. Cl. 62—49 10 Claims

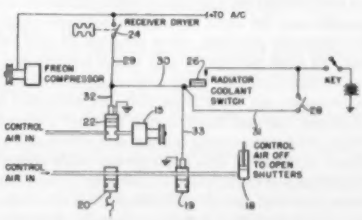


1. In a process for vaporizing vaporizable cryogenic liquid by heat exhange in the tubes of a shell and tube heat exchanger wherein the tubes define inlet ends, an improved method of metering the delivery of the cryogenic liquid into said tube ends comprising the steps of:
- delivering the liquid firstly into a plurality of small metering tubes thermally isolated from said heat exchanger tube inlet ends and having delivery ends extending one each to within said heat exchanger tube inlet ends; and
- causing the liquid to then flow into the heat exchanger tubes from said delivery ends of the metering tubes within said heat exchanger tube inlet ends.

4,133,185
AUTOMATIC AIR CIRCULATION CONTROL

Robert B. Dickey, Seattle, Wash., assignor to PACCAR Inc., Bellevue, Wash.

Continuation of Ser. No. 734,374, Oct. 20, 1976, abandoned.
This application Apr. 3, 1978, Ser. No. 892,501
Int. Cl.² F25B 39/04; F01P 7/10
U.S. Cl. 62-179 5 Claims



1. An automatic engine air circulation control system for an engine of the type having in line air conditioning refrigerant

condenser, air flow shutter, engine coolant radiator and de-energizable fan, the improvement comprising:

first control means for automatically opening the air flow shutter and energizing the fan when the refrigerant pressure exceeds a predetermined value, and

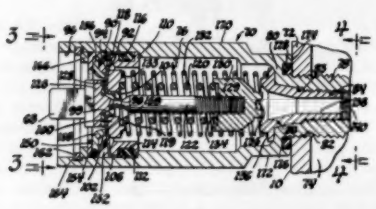
second control means for automatically opening the air flow shutter and energizing the fan when the coolant temperature increases to a predetermined value,

whereby the shutter is open and the fan energized during excessive refrigerant pressures regardless of coolant temperature and the shutter is open and the fan energized during excessive coolant temperatures regardless of refrigerant pressure.

4,133,186
COMBINED ELECTRICAL CUT-OFF AND RELIEF VALVE

Byron L. Brucken, Miamisburg, and Frank W. Hodits, Jr., Kettering, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 17, 1977, Ser. No. 842,455
Int. Cl.² F25B 1/00
U.S. Cl. 62—228 **1 Claim**

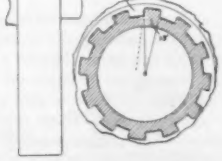


1. An improved combination high fluid pressure relief valve and low fluid pressure electrical contact cut-off control assembly for mounting in an opening of the discharge cavity of an automotive air conditioning compressor which is enabled for selective operation by electric circuit means, said control assembly comprising; a housing defining a valve chamber with a high fluid pressure input tubular stem connection extending centrally from the housing bottom end for insertion into the compressor discharge cavity, a central bore through said stem, said central bore being internally threaded, a spring metal flexible diaphragm having a central valve opening circumscribed by a collar on the underside thereof and having the capability for snap-action, said diaphragm extending across said chamber upper open end so as to be exposed on its underside to the fluid pressure within said chamber and exposed on its top side to atmospheric pressure, the periphery of said valve opening on said diaphragm top side defining a valve seat, an axial shaft extending through said valve opening and having a valve head on its upper end including seal means at the underside of said head and a threaded portion on its lower end; an inner spring retainer threaded on said shaft lower end, an outer spring retainer in axially spaced relation below said inner spring retainer having an externally threaded integral shank mounted in said central bore for cooperative threaded engagement therewith and for axial movement between axially extended and retracted positions upon rotation of said retainer stem therein, an axial passage in said shank terminating in an outer spring retainer entrance region between said passage and said valve chamber, an inner high pressure set point spring disposed between the said inner spring retainer and said diaphragm collar, said inner spring biasing said valve seat against said shaft head seal means, said inner spring being compressed to set a predetermined high pressure condition in said chamber at which said shaft seal means is unseated from said valve seat in response to said condition and the compression of said inner spring, thereby allowing the high pressure fluid in said compressor discharge cavity to escape to the atmosphere through said chamber whenever the pressure in the compressor discharge cavity is above said predetermined high pressure, said inner spring retainer having engaging means on its free end accessible by the insertion of an adjusting tool through said axial passage in said shank, whereby said inner spring retainer may be threadably adjusted axially upon rotation thereof by the adjusting tool cooperating with said engaging means, an outer low pressure set point spring disposed around said inner spring and extending between said outer spring retainer and said collar, a contact ring supported in said housing in electrically conductive relation with said diaphragm, said contact ring electrically insulatingly supported by an outer diaphragm stop member fixed in said chamber open end, said outer spring biasing said diaphragm against said contact ring to prevent flexing of said diaphragm away from said ring so that said circuit means may be closed, means in said shank for receiving an adjusting tool enabling the rotation of said outer spring retainer such that said outer spring is adjustably compressed by said outer spring retainer between said outer spring retainer and said collar to set a predetermined low pressure condition in said chamber at which said diaphragm is prestressed to flex downwardly and snap-actingly away from said contact ring but not from said seal means in response to the compression of said outer spring and said atmospheric pressure for opening said circuit means without opening said valve opening to prevent the compressor from operating whenever the pressure in the compressor discharge cavity is below said predetermined lower pressure.

4,133,187
FLEXIBLE-DISK COUPLING

Ernest Wildhaber, 124 Summit Dr., Rochester, N.Y. 14620

Filed Jan. 6, 1977, Ser. No. 757,364
Int. Cl.² F16D 3/78
U.S. Cl. 64—13 **5 Claims**



1. A flexible-disk coupling for connecting two rotary parts, containing

a flexible disk attached adjacent its outside periphery to one of said parts and adjacent its inside periphery to the other of said parts,

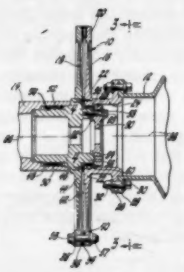
the latter connection being with splines having straight radial sides intersecting, when extended, the axis of said other part, to allow the internal splines to expand more than the mating external splines while maintaining contact between the mating splines without introducing backlash.

4,133,188

BACK-UP TORQUE TRANSMITTING STRUCTURE

John N. Cartwright, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 13, 1977, Ser. No. 815,107
Int. Cl.[2] F16D 3/79; F16B 7/18
U.S. Cl. 64—13 2 Claims



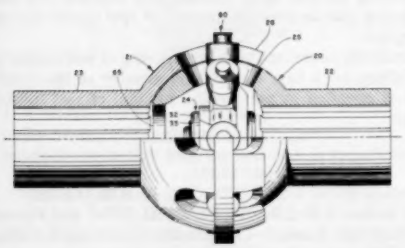
2. A shaft coupling assembly for connecting a first shaft to a second shaft and to accommodate axial misalignment therebetween comprising a first coupling hub having means thereon for connecting said hub to a first shaft, a second coupling hub having means thereon for connection to a second shaft, an outer peripheral flange on said first hub having a thin-sectioned disc secured thereto and extending radially outwardly thereof, an outer peripheral flange on said second hub having a thin-sectioned disc secured thereto and extending radially outwardly thereof, means including a spacer ring connecting the outer peripheries of said discs to maintain an axial space between said first and second hubs to allow for limited angular movement between said first and second hubs to accommodate shaft misalignment, an extension on said first hub telescoped interiorly of said second hub, and means including first and second sets of spline teeth on said extension and said second hub, said first and second sets of teeth being both radially and circumferentially spaced to permit the aforesaid limited angular movement for shaft alignment and operative to directly couple the first and second shafts when circumferential spacing between said sets of spline teeth is closed due to excessive torsional angular movement between the first and second shafts.

4,133,189

CONSTANT-VELOCITY UNIVERSAL JOINT

Arthur E. Rineer, P.O. Box 115, Beulah, Mich. 49617

Filed May 18, 1977, Ser. No. 798,260
Int. Cl.[2] F16D 3/30
U.S. Cl. 64—17 R 4 Claims



1. A universal joint, comprising:

an outer hollow spherical member having means for receiving a first shaft, and having a plurality of peripherally-spaced channels each having an axis disposed substantially in a plane containing the axis of said first shaft;

an inner hollow spherical member receivable within said outer spherical member opening to a position of concentricity, and having means for receiving a second shaft, the axis of said second shaft normally traversing said outer spherical member opening, and

said inner spherical member having a plurality of channels each having an axis disposed substantially in a plane containing the axis of said second shaft; and

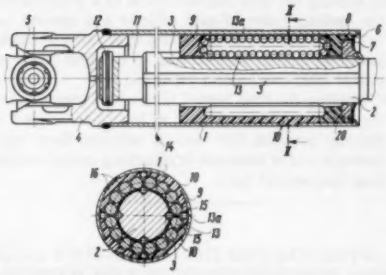
a transfer assembly including a plurality of angularly spaced components traversing aligned portions of channels in said inner and outer spherical members, respectively, for transfer of forces peripherally between walls defining said channels, said transfer assembly components being secured with respect to each other with freedom for relative angular articulation in substantially coplanar relationship.

4,133,190

CARDAN DRIVE SHAFT WITH TELESCOPING SHAFT PARTS

Walter Schuller, Mössingen, Germany, assignor to Firma Eberhard Hoeckle GmbH, Germany

Filed Jun. 14, 1977, Ser. No. 806,550
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1976, 2632537
Int. Cl.[2] F16D 3/06
U.S. Cl. 64—23.7 12 Claims



1. A cardan drive shaft with two telescoping shaft parts joined so as to be fixed relative to each other in rotation, by circulating roll bodies with guide tracks for the roll bodies, an inner guide track comprising axially running guide grooves, an intermediate ring of guide rolls applied against each other without clearance, said guide rolls being disposed in the outer shaft part so as to be fixed against twisting, and held with bias in an inset device which presents a troughlike depression for each guide roll and recesses for the back-running roll bodies and which is held in the outer shaft part by projections that positively engage therein.

4,133,191

KNITTED FABRIC HAVING OPEN AREAS

James H. Blore, and Bobby L. Balcombe, both of Greenville, S.C., assignors to Phillips Fibers Corporation, Greenville, S.C.

Filed Apr. 9, 1976, Ser. No. 675,420
Int. Cl.[2] D04B 11/04
U.S. Cl. 66—197 23 Claims

1. A method of preparing a double knit fabric having a plurality of relatively open areas, which comprises:

(I) forming a double knit fabric by

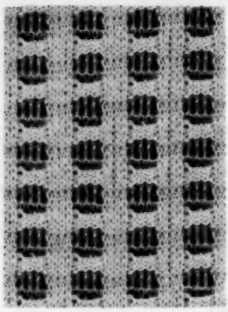
(a) knitting at least one body course employing at least one first yarn;

(b) then knitting, in immediate succession to said at least one body course, at least one first locking course employing at least one second yarn, said second yarn being formed of a thermoplastic material having a lower melting point than said first yarn; and

(c) then in immediate succession to said at least one first

locking course, knitting a first plurality of consecutive body courses employing a plurality of first yarns while causing, in each of a plurality of areas in said first plurality of consecutive body courses, at least one stitch to be cast off;

(II) stressing the thus knitted fabric to cause the thus cast-off stitches to unravel to a point near to but not past said at least one first locking course employing at least one second yarn;



(III) heating the thus stressed fabric to a temperature above the melting point of said at least one second yarn and below the melting point of said first yarns to cause said at least one second yarn to fuse to the first yarns touching said at least one second yarn; and

(IV) cooling the thus heated fabric to a temperature below the melting point of said at least one second yarn to thereby prevent the cast-off stitches from unraveling through said at least one first locking course employing at least one second yarn.

4,133,192

APPARATUS FOR THE CONTINUOUS LIQUID PROCESSING OF CLOTH IN A HIGH PRESSURE STEAMER

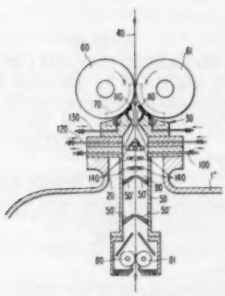
Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama, Japan, assignors to Sando Iron Works Co., Ltd., Wakayama, Japan

Division of Ser. No. 776,911, Mar. 11, 1977. This application Sep. 30, 1977, Ser. No. 838,396

Claims priority, application Japan, Mar. 18, 1976, 51-29526; Nov. 19, 1976, 51-39260

Int. Cl.[2] D06B *23/18*

U.S. Cl. 68—5 E **1 Claim**



1. A continuous liquid processing apparatus for cloth comprising a high pressure steamer vessel having a cloth inlet, a sealing mechanism mounted on said steamer at the cloth inlet and forming an elongated laterally closed cloth passage having an external opening to said passage on the exterior of said steamer and an interior opening from said passage into the interior of said steamer a pair of rubber sealing rolls closing the external opening of said passage, end plane sealing plates positioned at the opposite ends of said sealing rolls, gap rolls provided at the interior opening of said cloth passage, elastic sealing plates located in said cloth passage adjacent the exterior opening and in contact with said sealing rolls, pressurized air blow-in tubes and pressurized water feeding tubes connected to said sealing mechanism and opening into said cloth passage wherein the improvement comprises that said cloth passage forms a pre-heating chamber, a plurality of valve-seats provided in opposed relation and in a multi-step arrangement within said cloth passage and subdividing said pre-heating chamber, reducing exhaust tubes are connected to said pre-heating chamber, and processing liquid spray nozzles spaced apart in the elongated direction of said cloth passage and disposed in a parallel multi-step arrangement within said pre-heating chamber so that said nozzles face both surfaces of the cloth passing through said passage.

4,133,193

THROTTLE GRIP LOCKING DEVICE FOR MOTORCYCLES

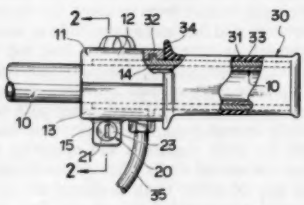
Rentaro Sanada, Asaka, and Shigeo Kawada, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1977, Ser. No. 861,409

Claims priority, application Japan, Dec. 20, 1976, 51-170695[U]

Int. Cl.[2] B60R *25/04*; E05B *65/12*; F16K *35/10*; G05G *5/00*

U.S. Cl. 70—183 **7 Claims**



1. A throttle grip locking device for a motorcycle, comprising:

a rotary throttle grip for controlling the operation of the engine of said motorcycle;

said rotary throttle grip having stationary portions and movable portions;

a locking member and an engaging part mounted in one of said stationary portions of said throttle grip;

said locking member being disengagably engaged with said engaging part to prevent rotation of said rotary throttle grip; and

as operatively connected with the stopping of said engine by switching off a key, said locking member of the handle side is operated to prevent the rotation of said throttle grip.

4,133,194

MAGNETIC KEY OPERATED DOOR LOCK

Bruce S. Sedley, R.R. 1 Box 96, Koloa, Hi. 96756, and Howard M. Allenbaugh, Gardena, Calif., assignors to Bruce S. Sedley, Koloa, Hi.

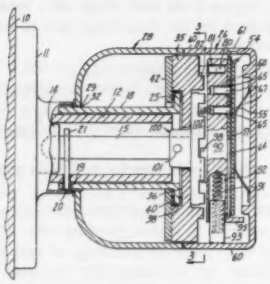
Filed Dec. 2, 1976, Ser. No. 746,705

Int. Cl.[2] E05B *13/10, 47/00*

U.S. Cl. 70—222 **7 Claims**

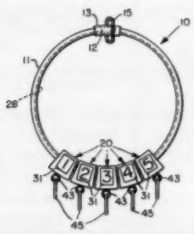
3. In a lock structure having means for unlocking the same and wherein said means includes a member adapted to be rotated about an axis for so unlocking said structure,

a housing rotatably supported on said structure,
a slide in said housing in face to face relation relative to said member and mounted for sliding movement radially of said axis,
said member and said slide being formed with interengaging elements,
means in said housing preventing relative rotational movement of said slide and housing and permitting sliding movement of said slide from a normal locking position with said elements out of engagement to an unlocking



position with said elements in engagement for connecting said member and slide together for rotating said unlocking member upon rotation of said housing,
said housing being formed with an opening permitting the insertion of a magnetic card key therethrough in said radial direction for pushing said slide to unlocking position,
a locking magnet in said slide normally holding said slide fixed relative to said housing and movable to an unlocking position under the influence of such card key to allow said sliding movement of said slide.

4,133,195
DEVICE FOR MANAGING KEYS AND LOCKS
Michael J. McLaren, 2844 NW. 59th St., Seattle, Wash. 98107
Filed Jan. 19, 1978, Ser. No. 870,631
Int. Cl.[2] A47G *29/10*
U.S. Cl. 70—456 R **9 Claims**



1. A retainer for keys, comprising
a ring having two, separable ends,
means for releasably securing said ends in engagement with each other to maintain said ring in a circular configuration,
a plurality of like blocks slidably mounted on said ring for limited movement thereon in a circumferential path coaxially of the center of said circular ring configuration,
means for releasably attaching a key to one end of each of said blocks,
each of said blocks having on one side thereof an indicator surface with key identifying means thereon, and
guide means for securing said blocks against rotation about the centerline of said ring with said one end of each block facing externally of said ring, and with said indicator surfaces facing in the same direction at one side of said ring,
said guide means including a rectangular slot formed in one of the confronting sliding surfaces on said ring and on each of said blocks, respectively, and the other of said sliding surfaces being rectangular in cross section and being slidable in said slot.

4,133,196
KEY CHAIN CONSTRUCTION
Gerald A. Petersen, 10 De Sabla Rd., #709, San Mateo, Calif. 94403
Continuation-in-part of Ser. No. 712,764, Aug. 9, 1976, abandoned. This application Sep. 8, 1977, Ser. No. 831,439
Int. Cl.[2] A44B *15/00*
U.S. Cl. 70—457 **2 Claims**

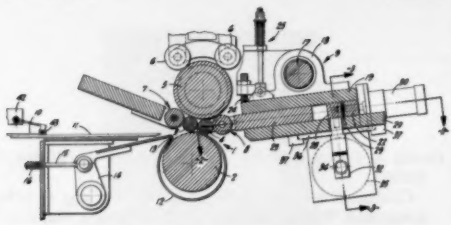
1. A key chain comprising an elongated chain having a plurality of first links, a plurality of second links interfitting into adjacent first links and normally oriented at right angles to said first links, each of said first and second links being similar and oblong in shape having parallel sides and semi-circular ends and being formed of wire of thickness "A", said links being of width "4A" and length "5A", a fitting fixed to a first end of said chain of a thickness about "3A", said fitting being formed with a first slot extending inward from an edge of said fitting to a terminus located a distance substantially greater than "4A" from said edge, a second slot at right angles to said first slot at a distance "2A" from said terminus, the widths of said slots being slightly greater than "A", the distance "5A" being such that neither said first nor said second links can slide through said first slot, said chain also having a third link oblong in shape and formed of wire of thickness "A" and width "4A" and a length of "9A" so that said third link can slide through said first slot, said third link being interposed between one of a pair of said first links or one of a pair of said second links, and a spherical knob of a diameter no greater than "4A" on a second end of said chain, said knob being large enough to prevent said second end from sliding out of said slots, said knob having a curvature great enough so that said knob will rest upon said fitting and not slip into said slots so that the user can grip said knob conveniently, said first links and said second links normally being disposed at oblique angles to each other when said chain is loose so that said links will not slip through said slots until said chain is manually extended to become taut, said first and second slots and said first, second and third links being dimensioned so that none of said links can rotate when in said first slot, said second slot or the intersection of said first and second slots.

4,133,197

ROLL-TYPE MACHINE FOR FORMING CYLINDRICAL SHEET METAL BODIES

Howard Allen, Stockton, Calif., assignor to Carando Machine Works, Stockton, Calif.

Filed Aug. 29, 1977, Ser. No. 828,838
Int. Cl.[2] B21D 5/08
U.S. Cl. 72—15 9 Claims



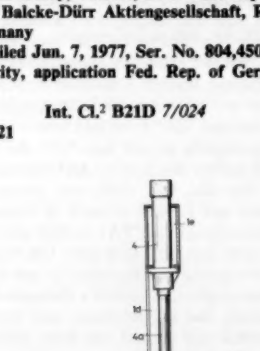
1. In a roll-type machine, for forming a cylindrical body from an initially flat sheet of metal, a parallel axis, roll array including a driven primary roll, a driven pinch roll disposed closely adjacent but in spaced working relation to the face of the primary roll, and a driven forming roll in a predetermined position relative to and immediately beyond the pinch roll and disposed closely adjacent but in spaced working relation to said face of said primary roll, all said rolls being driven with the adjacent faces thereof turning in the same direction; means mounting the forming roll in a normally fixed working position but retractable to a non-working position, and means operative to cause such retraction of the forming roll; the initially flat sheet of metal being fed to the pinch point between the primary roll and the pinch roll, and thence advanced by said primary and pinch rolls to engagement with the forming roll and thereby progressively bent as a cylindrical body extending about the primary cylinder; and the means to cause such retraction of the forming roll being actuated in response to a predetermined feeding position of the sheet of metal.

4,133,198

APPARATUS FOR BENDING LARGE AREA CONSTRUCTION UNITS

Josef Huda, Ratingen; Heinrich Coenenberg, Düsseldorf-Rath, and Friedhelm Aubry, Velbert, all of Fed. Rep. of Germany, assignors to Balcke-Dürr Aktiengesellschaft, Ratingen, Fed. Rep. of Germany

Filed Jun. 7, 1977, Ser. No. 804,450
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1976, 2630896
Int. Cl.[2] B21D 7/024
U.S. Cl. 72—321 7 Claims



1. The apparatus for bending large area construction units, in particular tightly welded tubular walls for boiler construction, comprising

a frame,

a supporting table mounted on said frame and adapted to support a not to be deformed part of a construction unit,

moveable pressing means for holding down the not to be deformed part of the construction unit against said supporting table at least in a vicinity of a bending zone,

a pivot table means, pivotally mounted relative to said supporting table defining a pivot axis, for bending a remaining part of the construction unit,

a slide plate disposed on said pivot table means and abuttingly engaging on the remaining part to be bent of the construction unit,

said slide plate is freely displaceably guided with respect to said pivot table in a longitutinal direction thereof transverse to a bending of the bending zone,

said pivot table has flanges formed with a first recess, respectively,

said frame has bearing flanges formed with second recesses, respectively,

bearing members constituting means for adjustment of the pivot axis relative to said supporting table as well as relative to said slide plate by exchange of said bearing members, the latter are exchangeably mounted in said first recesses of said pivot table flanges, respectively, and in said second recesses of said bearing flanges of said frame, respectively,

a bore means formed in said bearing members, respectively, and arranged corresponding respectively with one of a plurality of desired positions of the pivot axis, said bore means of said bearing members are aligned when the latter are mounted in said recesses of said flanges, respectively,

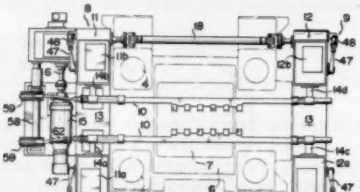
a bearing bolt disposed in the aligned said bore means of said bearing members defining said pivot axis.

4,133,199

TRANSFER MECHANISM FOR FORGING MACHINES

Shojiro Shirao, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Mar. 11, 1977, Ser. No. 776,898
Int. Cl.[2] B21D 43/05
U.S. Cl. 72—405 4 Claims



1. A transfer mechanism for use in forging machines, including a bolster comprising a pair of transfer bars mounted in substantially parallel relationship with each other, each being adapted to support gripper means for gripping blanks to be transferred, said transfer bars being supported for operation through a cycle including movement in three dimensions, each dimension being substantially perpendicular to the other two dimensions of movement, first, second and third driving means operable in timed relationship so as to move said transfer bars, each driving means being operable to move said transfer bars in one of said dimensions, said first and second driving means including four cylinders and a pair of cams, respectively, whilst said third driving means including a pair of cylinders and a pair of cams, at least two out of four cylinders of either of said first and second driving means and the pair of cylinders of said third driving means being adapted to urge cam follow-

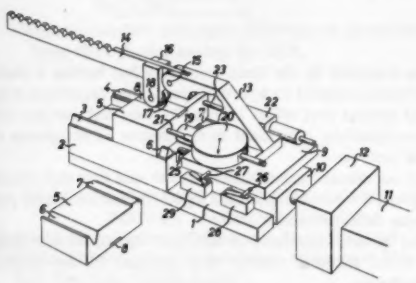
ers against said cams during the cycle of operation so as to transmit driving force for moving said transfer bars in one of said dimensions, and a pair of U-shaped casings, one mounted at each of the ends of said transfer bars so as to provide enough space to accommodate said transfer bars as well as loading and unloading means therein.

4,133,200

APPARATUS FOR TESTING LUBRICANTS

Daniel G. Cray, Ris Orangis, France, assignor to The British Petroleum Company Limited, Sunbury-on-Thames, United Kingdom

Filed Oct. 25, 1977, Ser. No. 845,372
Claims priority, application France, Oct. 22, 1976, 76 31973
Int. Cl.[2] G01N *3/56, 19/02*
U.S. Cl. 73—10 3 Claims



1. Apparatus for assessing the lubricating properties of lubricants, comprising one or more fixed slides and one or more moving slides which can be displaced on the fixed slide or slides with the interposition of a film of lubricant, means for applying a pressure between the moving slide or slides and the fixed slide or slides, and means for determining the resistance opposed to the displacement of the moving slide or slides on the fixed slide or slides, characterised in that it comprises, in combination,

at least one fixed slide carrier block adapted to carry slides of different materials

at least one moving slide carrier block, shorter than the fixed slide carrier block, adapted to carry slides of different materials, said slides of the moving carrier block having profiles complementary to the slides of the fixed slide carrier blocks and adapted to be placed on them

a drive block capable of moving parallel to the slide block at constant speed, and carrying on the side facing the moving slide block a compressible elastic element by means of which the said drive block acts against the moving slide block and pushes it when driven

means for loading the moving slide block against the fixed slide block at a constant, pre-determined pressure comprising a bracket on the drive block, a lever articulated on the bracket at one end having a roller thereon and exerting pressure through the roller on the moving slide block, and means for attaching weights to the free end of the lever, and

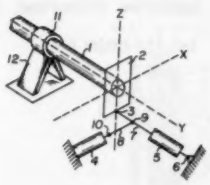
means for measuring, from the elastic compression of the elastic element and the relative displacement of the moving slide block and the drive block, the friction of the moving slide block on the fixed slide block.

4,133,201

TESTING APPARATUS FOR VEHICLES AXLES

Friedrich Klinger, Darmstadt-Arheilgen, Fed. Rep. of Germany, assignor to Firma Carl Schenck AG, Darmstadt, Fed. Rep. of Germany

Filed Sep. 13, 1977, Ser. No. 832,906
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1976, 2642155
Int. Cl.[2] G01M *17/04*
U.S. Cl. 73—12 11 Claims



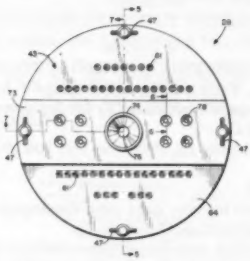
1. An apparatus for testing a structural component by applying several forces to said structural component, comprising force applying means including at least one force introducing point, actuating power means and force transmitting means operatively interconnecting said actuating power means to said force introducing point of said force applying means, lever means operatively connected to said force transmitting means and thus indirectly to said force introducing point, said apparatus further comprising further means operatively connected to said lever means for applying an additional force component to said force introducing point through said lever means, whereby two force components are simultaneously applied to said one force introducing point through said force transmitting means.

4,133,202

MULTIPLE NOZZLE SINGLE STAGE IMPACTOR

Virgil A. Marple, Minneapolis, Minn., assignor to The Regents of the University of Minnesota, Minneapolis, Minn.

Filed Apr. 22, 1977, Ser. No. 789,815
Int. Cl.[2] G01N *15/02*
U.S. Cl. 73—28 90 Claims



1. A single stage impactor unit having a particle collection efficiency curve that approximates a predetermined curve comprising: particle collecting means having at least one surface for collecting particles and at least one passage located adjacent said surface allowing particles to move through the collecting means, and impactor means having a plurality of separate openings aligned with said surface for directing particles toward said surface, said openings having at least two different cross sectional areas and wherein the total cross-sectional areas of all openings of each size are substantially equal, whereby when gas and particles are moved through said openings, with the same pressure drop across the openings, particles of a particle size range related to the size of each opening

moving through each opening are collected on said surface so that the combined particle collection efficiency curve of all the openings approximates a predetermined curve.

4,133,203

APPARATUS FOR TESTING THE BURST STRENGTH OF A LINE OF PERFORATIONS

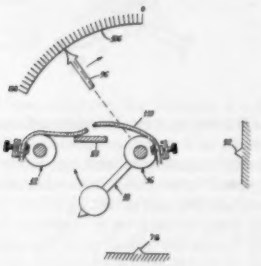
Alfred Walter, Schlieren, Switzerland, assignor to Alfred Walter AG, Schliern, Switzerland

Filed Jan. 6, 1978, Ser. No. 867,622

Claims priority, application Switzerland, Jan. 10, 1977, 258/77

Int. Cl.[2] G01N *3/32*

U.S. Cl. 73—838 **10 Claims**



1. Apparatus for testing the burst strength of a line of perforations in a paper comprising a frame, first means fixedly mounted on said frame for gripping said paper on one side of said line of perforations, second means rotatably mounted on said frame in spaced relation to said first means for gripping said paper on the other side of said line of perforations, a pendulum attached to said second means for causing rotation thereof when said pendulum is swung, said pendulum being swung from a start position where energy is stored in said pendulum, through a second position where the paper is rendered taut and the line of perforations is burst and to a position where the energy remaining in the pendulum after the bursting action is dissipated, and an indicating means actuated by said pendulum for indicating the amount of energy remaining in the pendulum after the bursting action.

4,133,204

ROUGHNESS DIAGNOSTIC TOOL

John Mittleman, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 15, 1978, Ser. No. 906,180

Int. Cl.[2] G01B *5/28*

U.S. Cl. 73—105 **12 Claims**

11. A diagnostic tool for measuring the degree of fouling of the hull of a ship, said tool comprising:

a housing having a cylindrical recess defined therein that is open at one end and adapted to be closed by placement of said housing against a test surface, said housing also having a watertight chamber defined therein and separated from said recess;

an electric motor mounted in said chamber and comprising a tubular rotary shaft extending into said recess;

a first disc disposed in said recess and fixed to the outer end of said tubular shaft for rotation therewith;

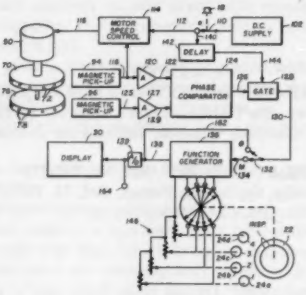
a second disc disposed in said recess in spaced, parallel and coaxial relatin to said first disc and having one face lying in a plane adjacent said open end of said recess;

an elongated, torsionally resilient member having one end fixed to said second disc and extending coaxially into the lumen of said tubular shaft, said torsionally resilient member having its other end fixed within said tubular shaft whereby said second disc is coupled to said first disc for torsionally resilient displacement relative to said first disc;

said first and second discs each having a plurality of magnets spaced about their respective peripheries;

first and second magnetic pick-ups mounted in said housing adjacent the peripheral edges of said first and second discs, respectively;

motor speed control means, for causing said motor to run at a predetermined speed whereby said first and second magnetic pick-ups produce first and second signals each



characterized by the same frequency but having a phase difference related to hydrodynamic drag experienced by said second disc when exposed to said test surface and corresponding in amount to the degree of roughness of said surface;

signal comparator means responsive to said first and second signals, for providing a third signal corresponding to said phase difference; and

display means, responsive to said third signal, for providing a visual read-out thereof as a measure of test surface roughness.

4,133,205

IDENTIFICATION OF ENGINE CYLINDER HAVING FAULT

Leonard R. Hulls, Marblehead, and Stephen C. Hadden, Acton, both of Mass., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 25, 1977, Ser. No. 854,834

Int. Cl.[2] G01M *15/00*

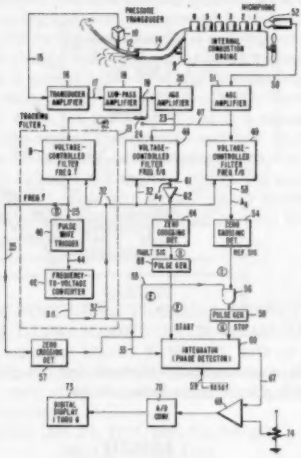
U.S. Cl. 73—117.3 **10 Claims**

1. Means for identifying the cylinder of an internal combustion engine having a fault, comprising

means including a reference transducer to produce a reference engine-cycle sine wave electrical signal having a phase determined by the position of the transducer with relation to a reference one of the cylinders of the engine,

means including a non-contacting fault transducer to produce a fault engine-cycle sine wave electrical signal having a phase determined by the one of the cylinders having a fault,

means to detect the phase difference between said fault electrical signal and said reference electrical signal, and



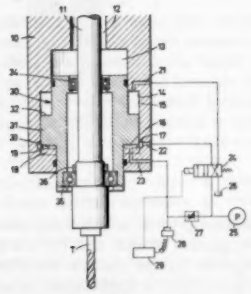
means to translate said phase difference to an indicia identifying the cylinder having the fault.

4,133,206

THRUSTING FORCE DETECTING DEVICE OF A ROTARY MACHINING TOOL

Katsuaki Hida; Tadasu Matsushima; Yasuhiko Ishida, and Yoshihira Nakano, all of Osaka, Japan, assignors to Shin Nippon Koki Co., Ltd., Osaka, Japan

Filed Sep. 8, 1977, Ser. No. 831,683
Claims priority, application Japan, Jun. 20, 1977, 52-81260[U]
Int. Cl.[2] G01L *5/12*
U.S. Cl. 73—133 R **1 Claim**



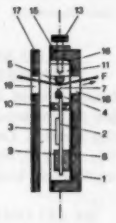
1. A thrusting force detecting device for a rotary machining tool comprising a cylinder chamber formed within a ram for lowering and elevating a spindle of a cutting tool, a fluid chamber formed within the cylinder chamber and having a larger diameter than the cylinder chamber, a piston slidably and liquid-tightly fitted in the cylinder chamber and having a collar thereabout liquid-tightly fitted in the fluid chamber, the collar dividing the fluid chamber into first and second chambers, the piston being rotatably mounted about the spindle in axially fixed relation thereto, means for supplying fluid pressure to the first and second chambers, and pressure sensitive means responsive to the pressure variation in the second chamber.

4,133,207

DEVICE FOR DETECTING KNOT-LIKE THICK PLACES IN TRAVELLING TEXTILE THREADS

Erich Weidmann, Wetzikon, and Hans Zollinger, Grüt, both of Switzerland, assignors to Gebruder Loepfe AG, Wetzikon, Switzerland

Filed Aug. 22, 1977, Ser. No. 826,971
Claims priority, application Switzerland, Oct. 13, 1976, 12922/76
Int. Cl.[2] G01N *19/08*
U.S. Cl. 73—160 **2 Claims**



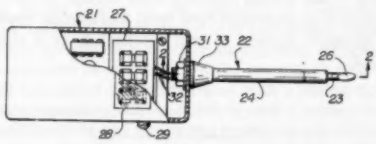
1. A device for detecting knot-like thick places in travelling textile threads, comprising:
a support structure;
a mechanical vibratory system comprising:
a vibratable plate-shaped member having two opposite ends, one of which is fixed at the support structure and the other of which is free and formed with a first straight edge;
a plate-shaped piezoelectrical structure fixedly attached to one major face of said vibratable plate-shaped member and responsive to vibration thereof;
the mechanical vibratory system having a fundamental frequency below 100 Hz;
a thread guide member mounted at the support structure and formed with a second straight edge arranged substantially parallel to and in opposite relationship to said first straight edge such that a thread passage gap is formed between said first and second straight edges; and
means for adjusting the width of said thread passage gap.

4,133,208

PROBE-TYPE READ-OUT THERMOMETER

Conrad A. Parlanti, 194 Constitution Dr., Menlo Park, Calif. 94025

Filed Jan. 26, 1978, Ser. No. 872,374
Int. Cl.[2] G01K *7/00*
U.S. Cl. 73—362 SC **7 Claims**



1. A heat-sensitive, digital read-out thermometer comprising
a probe having a distal tip and a shank,
said tip having a semi-conductor therein in thermal contact with the exterior of said tip,
a casing associated with said shank and having a digital display and electronic components contained therein,
lead wires from said semi-conductor extending through said shank and into said casing,
and an electrical circuit comprising a driver for said digital display, a stable reference voltage source,
a plurality of temperature stable resistors arranged in a

voltage divider network, a voltage to current charge resistor of the same material and temperature coefficient as said first-mentioned resistors and of a value to generate a compatible voltage charge acceptable to said driver, said voltage to current charge resistor being connected to one of said lead wires and to ground, said one of said lead wires being connected to said driver.

4,133,209

ALTIMETER

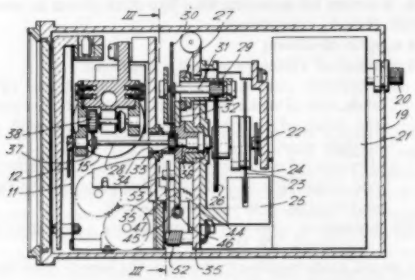
John R. Holtam, Stroud; Donald J. Ford, Cheltenham, both of England, and Roger A. Freeman, Clearwater, Fla., assignors to Smiths Industries Limited, London, England

Filed Sep. 6, 1977, Ser. No. 831,021

Claims priority, application United Kingdom, Sep. 3, 1976, 36693/76

Int. Cl.[2] G01L 7/12

U.S. Cl. 73—387 **11 Claims**



1. An instrument for providing an output representation in accordance with an input variable, including means responsive to said input variable, a differential having one input which is coupled to said responsive means and an output which provides said output representation, a mechanism which cooperates with a second input of said differential and which is manually operable to effect adjustment to the setting of a datum against which said representation is provided, and mechanical feedback means operatively connected between said second input of said differential and said mechanism for applying mechanical feedback to said mechanism further to operate said mechanism in accordance with the datum setting so that the setting of said datum resulting from manual operation of said mechanism is dependent both upon that manual operation and the feedback applied to said mechanism as a consequence thereof.

4,133,210

SAMPLING APPARATUS

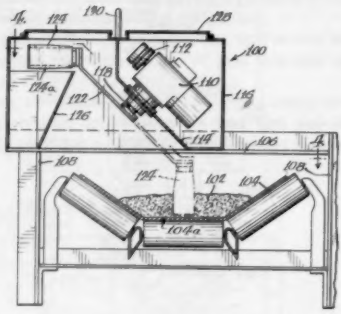
Ben E. Jaeger, Rte. 2, Box 49, Plano, Ill. 60545

Filed Feb. 23, 1978, Ser. No. 880,698

Int. Cl.[2] G01N 1/10

U.S. Cl. 73—424 **16 Claims**

1. A sampling apparatus for obtaining a multiplicity of small samples from a moving stream of materials, comprising a sample collecting scoop, and means for cyclically rotating said scoop through said stream of materials in an arcuate path which moves said scoop through said materials in directions



transversely and vertically thereof and longitudinally at a speed differing from that of the material.

4,133,211

SUCTION PIPETTE

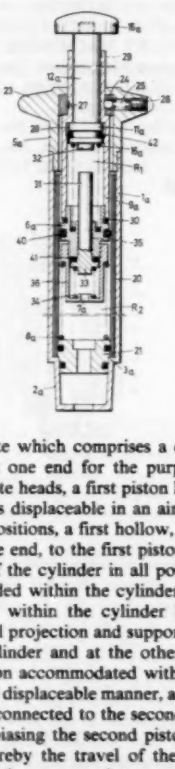
Walter Sarstedt, 5223 Nümbrecht, Rommelsdorf, Fed. Rep. of Germany

Filed Nov. 4, 1977, Ser. No. 848,396

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1976, 2651333

Int. Cl.[2] B01L 3/02

U.S. Cl. 73—425.6 **7 Claims**



1. A suction pipette which comprises a cylinder having a conical projection at one end for the purpose of mounting interchangeable pipette heads, a first piston located within the cylinder and which is displaceable in an air-tight manner between two limiting positions, a first hollow, cylindrical piston rod connected, at one end, to the first piston, said first piston rod projecting out of the cylinder in all positions of the first piston and being guided within the cylinder, a first compression spring disposed within the cylinder between the first piston and the conical projection and supported at one end on a shoulder of the cylinder and at the other end on the first piston, a second piston accommodated within the first piston rod in an air-tight and displaceable manner, a second piston rod one end of which is connected to the second piston, a second compression spring biasing the second piston away from the first piston and whereby the travel of the second piston is limited by stops in such a manner that a predetermined stroke volume is achieved which is small in relation to the stroke

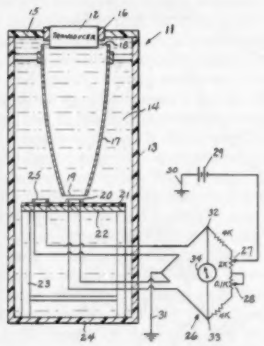
volume of the first piston in the cylinder, a first valve means controlled by the second inner piston rod and arranged, when the second piston is in a first limiting position with the second compression spring in its least compressed form, to connect the chamber formed by the first piston rod and the second piston with the open air, the first valve means being closed when the second piston is moved away from the first limiting position, and a second valve means also controlled by the second piston and arranged, when the second piston is in a second limiting position with the second compression spring in its most compressed form to connect said chamber with the chamber formed by the cylinder and the first piston, the second valve means being closed when the second piston moves a small distance away from the second limiting position towards the first limiting position.

4,133,212

PARABOLIC FOCUSSING THERMAL DETECTOR FOR LOW LEVEL ULTRASONIC POWER MEASUREMENTS

Bruce A. Herman, and Harold F. Stewart, both of Rockville, Md., assignors to The United States of America as represented by the Secretary of the Department of Health, Education & Welfare, Washington, D.C.

Filed Oct. 31, 1977, Ser. No. 847,022
Int. Cl.² G01H *3/12*
U.S. Cl. 73—647 **11 Claims**



1. An acoustic transducer testing apparatus comprising a vessel containing a sound-transmitting liquid, means to support a transducer on the vessel in a position in the liquid to direct sound energy therefrom into the vessel and through the liquid, stationary sensor support means in the vessel located in the path of the sound energy, temperature-responsive impedance means on said sensor support means, impedance-responsive electrical indicator circuit means connected to said temperature-responsive impedance means to show a temperature change of said impedance means responsive to emission of sound energy from said transducer, and a rigid parabolic reflector focussing means mounted within the liquid in said vessel in the sound transmission path between said transducer supporting means and said temperature-responsive impedance means and positioned substantially to focus the sound energy onto said impedance means, said parabolic reflector focussing means terminating short of its focal area and having an opening at the area of termination through which the sound energy passes to said temperature-responsive impedance means.

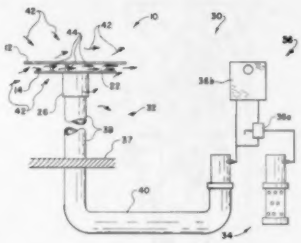
4,133,213

STATIC AIR PRESSURE DIFFUSER

Robert O. Brandt, Jr., Cary, N.C., assignor to Brandt Industries, Inc., Fuquay-Varina, N.C.

Filed Nov. 30, 1977, Ser. No. 855,976
Int. Cl.² G01L *7/00*
U.S. Cl. 73—756 **8 Claims**

1. A static air pressure diffuser adapted to be mounted atop a main probe extending externally from a structure for sensing static air pressure about said static air pressure diffuser, said static air pressure diffuser comprising: a generally circular and flat lower plate; a generally circular and flat upper plate disposed in parallel relationship to said lower plate and vertically spaced therefrom so as to define an open area between said first and second plates, said upper plate being of a greater diameter than said lower plate and so oriented and spaced above said lower plate such that said upper plate includes a generally circular overhang area that extends outwardly above the outside generally terminal edge of said lower plate, and wherein the diameter of said lower and upper plates is at least three times the vertical distance between said respective plates;



interconnecting means secured between said lower and upper plates for maintaining said two plates in parallel and vertical spaced apart relationship; opening means formed generally centrally within said lower plate; and coupling means associated with said static air diffuser for coupling said static air diffuser with said main probe such that said opening means formed in said lower plate is communicatively connected with said main probe when said static diffuser is properly mounted and secured atop said main probe, whereby static air pressure above said opening means and generally between said plates can be sensed and measured in this area without significant influence from dynamic air pressure factors since air moving between said plates is constrained to move generally parallel therebetween and perpendicular to said opening means.

4,133,214

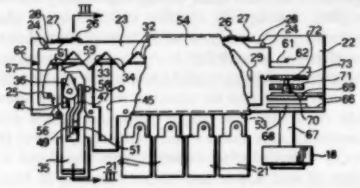
KEYBOARD FOR PRESETTING THE TUNING OF A RADIO RECEIVING APPARATUS

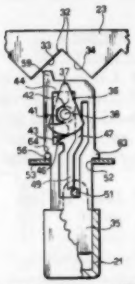
Dario Cicala, Turin, Italy, assignor to Seas di Grissino & C.S.a.S., Turin, Italy

Filed May 18, 1977, Ser. No. 797,956
Claims priority, application Italy, May 24, 1976, 68266 A/76
Int. Cl.² F16H *35/18*
U.S. Cl. 74—10.31 **15 Claims**

1. A keyboard for presetting tuning of a radio receiving apparatus, comprising a tuning setting slide manually operable for setting up the tuning for the reception of a plurality of transmitters, and a group of depressible key means, the slide being slidably movable in a direction substantially perpendicular to the direction of movement of the key means, and each one of said key means being associated with a tuning storing element for cooperating with said slide in such a manner that in a first condition of the key means said tuning storing element is conditioned to store the tuning preset by said slide and in a second condition of the key means said tuning storing element automatically sets up said slide according to the stored tuning, wherein each of said tuning setting elements comprises a wedge which is pivotally mounted on the associated key means, said slide being provided, in correspondence with each one of said wedges, with a pair of converging profiles adapted to cooperate directly with the associated wedge when the key means is depressed, the key means having releasable locking means for releasing said wedge when said key means is in said first condition, thus allowing said wedge to reach an angular position as dictated by the converging profiles of the slide when the key means is depressed, and for locking said wedge

against pivoting when said key means is in said second condition, whereby said slide is displaced by a camming action of





said wedge on said converging profiles when the key means is depressed.

4,133,215

LINEAR-ROTARY CONVERTER

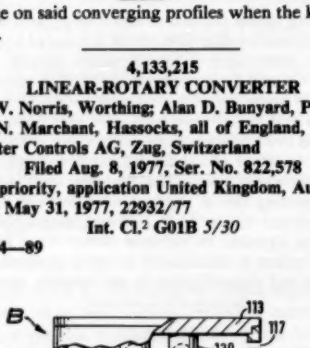
Kenneth W. Norris, Worthing; Alan D. Bunyard, Patcham, and Derek N. Marchant, Hassocks, all of England, assignors to Worcester Controls AG, Zug, Switzerland

Filed Aug. 8, 1977, Ser. No. 822,578

Claims priority, application United Kingdom, Aug. 11, 1976, 33374/76; May 31, 1977, 22932/77

Int. Cl.[2] G01B *5/30*

U.S. Cl. 74—89 **21 Claims**



1. A device for interconverting linear motion and rotatory motion, said device comprising:

(a) first, second and third elements mounted to permit linear motion of said second element relative to said first and third elements and rotatory motion of said second and third elements relative to each other and to said first element about a common axis parallel with the direction of said linear motion;

(b) a first plurality of elongate connecting elements each having a first length and extending between and universally pivoted at its first and second ends with said first and second elements respectively; and

(c) a second plurality of elongate connecting elements each having a second length and extending between and universally pivoted at its first and second ends with said second and third elements respectively,

wherein said first and second ends of said each connecting element of said first plurality are spaced from said axis at respective first and second radii, said first and second ends of said each connecting element of said second plurality are spaced from said axis at respective third and fourth radii, the tangential components of the directions in which the connecting elements of said first plurality extend away from said first element towards said second element are directed in one angular sense about said axis, the tangential components of the directions in which the connecting elements of said second plurality extend away from said second element towards said third element are directed in the other angular sense about said axis, and said linear and rotatory motions are interconvertable through pivotal action of said connecting elements.

4,133,216

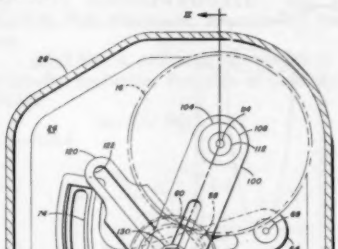
GEAR SUPPORT ASSEMBLY

Patrick J. Gentile, and Joseph P. Gentile, both of Pittsburgh, Pa., assignors to Vamco Machine & Tool, Inc., Pittsburgh, Pa.

Filed Dec. 16, 1977, Ser. No. 861,202

Int. Cl.[2] F16H *35/00, 1/06, 27/04*

U.S. Cl. 74—384 **8 Claims**



1. A gear support assembly comprising,

a drive shaft rotatably supported in a wall,

said drive shaft having a free shaft end portion,

a first gear nonrotatably secured to said drive shaft adjacent said drive shaft free end portion,

a driven shaft rotatably supported in said wall in spaced parallel relation to said drive shaft,

said driven shaft having a free shaft end portion,

a second gear nonrotatably secured to said driven shaft adjacent said driven shaft end portion,

intermediate gear means positioned in meshing relation with said first gear and said second gear for transmitting rotation from said drive shaft to said driven shaft,

said wall having gear change means connected thereto,

an intermediate shaft supported by said gear change means and having a free end portion, said intermediate shaft rotatably supporting said intermediate gear means in meshing relation with said first gear and said second gear,

first support means rotatably connected to said drive shaft end portion,

second support means rotatably connected to said driven shaft end portion, and

said first and second support means each being rigidly connected to said intermediate shaft to thereby connect the

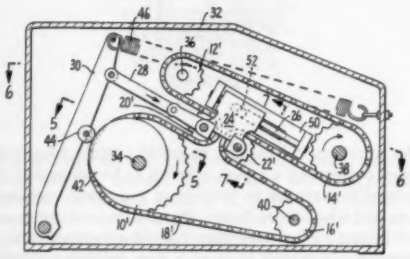
end portions of said shafts and prevent deflection of all of said shafts.

4,133,217

INTERMITTENT DRIVE AND TRANSFER MECHANISM

Hubert Blessing, Dallas, Tex., assignor to Levi Strauss & Co., San Francisco, Calif.

Filed Feb. 2, 1976, Ser. No. 654,705
Int. Cl.[2] F16H *33/06, 35/08*
U.S. Cl. 74—395 **3 Claims**



1. An intermittent drive assembly comprising first, second, third and fourth rotative members, rotative support means for separately mounting the first, second, third and fourth rotative members in a spaced apart generally rectangular configuration, an endless flexible drive member trained around the first, second, third and fourth rotative members in a manner such that the flexible drive member passes from the first, to the second, to the third, and to the fourth rotative members in that order, with slack loops in the flexible drive member between the first and second rotative members and between the third and fourth rotative members, movable idler means for controlling the length of the slack loops in the endless drive member between the first and second rotative members and between the third and fourth rotative members in an inverse fashion, such that when the slack in the loop between the first and second rotative members is increased, the slack between the third and fourth rotative members is decreased, and vice versa, and means for moving the movable idler members together for controlling the length of the respective loops of slack in the endless drive member, the rotative support for one of the first or fourth rotative members constituting a driving input and the rotative support for one of the second or third rotative members constituting the driving output of the assembly in combination with a transfer device comprising a pair of parallel, spaced apart, horizontal rails, a frame for rigidly mounting the rails, a carriage mounted to ride on the rails, an endless driving member connected to be driven by the output of the intermittent drive assembly, rotatable means mounted at the opposite ends of the rails for rotatably supporting the driving member, and means for attaching the carriage to the endless driving member, the attaching means including a pair of connecting bars and an equilateral, triangular member, the connecting bars being pivoted at one end to the carriage and at their other ends to opposite vertices of the triangular member, the triangular member having its remaining vertex pivotally attached to the driving chain.

4,133,218

CONTROL APPARATUS

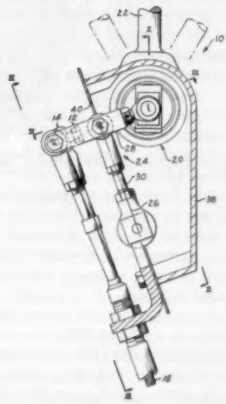
Carl W. Carter, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 26, 1977, Ser. No. 827,906
Int. Cl.[2] G05G *9/04, 5/02*
U.S. Cl. 74—471 XY **8 Claims**

1. Control apparatus comprising:

first and second assemblies each having a work element, said work elements each being movable between a first position at which said work elements are fully retracted and a second position at which said work elements are fully extended;

a single lever means for controllably moving said work elements in response to controlled movement of a single lever of said lever means, said lever being pivotally connected to said first assembly and movable in a first direction between a first position at which only said first work element is fully retracted and a second position at which only said first work element is fully extended, said lever being connected to said second assembly and movable therewith in a second direction generally perpendicular to the first direction between a first position at which only



said second work element is fully retracted and a second position at which only said second work element is fully extended, said lever being movable in the first and second directions simultaneously; and

means for locking said lever in a preselected position, said locking means including a locking member connected to one of said first and second assemblies and movable between a first position at which said locking member is engaged with the other of said assemblies and said lever means and a second position at which said locking member is free of engagement with the other said assembly and said lever means.

4,133,219

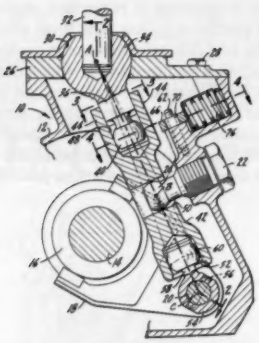
TRANSMISSION SHIFT CONTROL MECHANISM

Donald W. Keibel, and Jack M. Fisher, both of Muncie, Ind., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Apr. 27, 1977, Ser. No. 791,451
Int. Cl.[2] F16H *57/06*
U.S. Cl. 74—476 **3 Claims**

1. A transmission shift control mechanism comprising a control lever supported for movement in two directions, a link member connected with said control lever for rigid movement therewith upon movement of said control lever in one direction and for articulated movement relative thereto upon movement of said control lever in another direction, a shift element connected with said link member for articulated movement relative thereto in a first direction for selecting transmission ratios upon movement of said control lever in said one direction and for articulated movement relative thereto in a second direction for engaging transmission ratios upon movement of said control lever in said other direction, said link member being movable for effecting movement of said shift element to at least two selecting positions upon said movement of said control lever in said one direction and for effecting movement of said shift element to two engaging positions upon said movement of said control lever in said other direction, and means for

inhibiting said movement of said link member to one of said engaging positions after movement thereof sequentially to one



of said selecting positions and the other of said engaging positions.

4,133,220

STEERING SHAFT ASSEMBLY

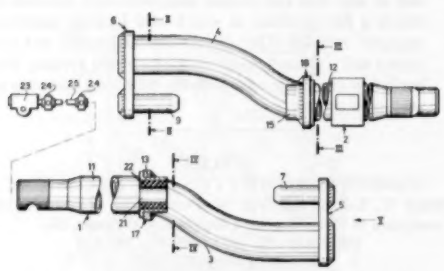
Josef Wenninger, Vorsfelde, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Mar. 3, 1977, Ser. No. 773,800

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1976, 2612829

Int. Cl.[2] **B62D** *1/18;* **F16D** *3/70*

U.S. Cl. 74—492 **7 Claims**



1. A steering shaft assembly for a motor vehicle comprising:

(a) two complementary shaft pieces adapted to be connected to the vehicle steering gear and steering wheel, respectively, said two shaft pieces having adjacent, overlapping end portions; and

(b) at least two independent, torque-transmitting plug connections which are axially spaced relative to each other along said end portions and which connect said shaft pieces together, each of said plug connections including projection means attached and extending parallel to one of said shaft pieces, and corresponding receptacle means, adapted to receive said projection means, attached to the other of said shaft pieces,

whereby said two shaft pieces of said steering shaft assembly may be disconnected upon application of a predetermined axial force, but said steering shaft assembly will not bend upon application of a transverse force thereto.

4,133,221

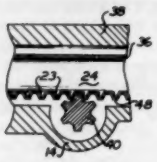
RACK GEAR AND METHOD OF MAKING THE SAME

Harry E. Clary, Sterling Heights, Mich., assignor to TRW, Inc., Cleveland, Ohio

Filed Jun. 23, 1977, Ser. No. 809,389

Int. Cl.[2] **B62D** *1/20;* **F16H** *1/04;* **B21D** *53/28;* **B21H** *5/00*

U.S. Cl. 74—498 **21 Claims**



1. An apparatus for turning steerable vehicle wheels, said apparatus comprising a pinion adapted to be connected with and rotated in response to rotation of a manually actuatable member, and a hollow rack gear disposed in meshing engagement with said pinion and adapted to be connected with the steerable vehicle wheels, said rack gear including a hollow tubular member having a longitudinally extending side wall in which a plurality of hollow teeth are formed, said side wall being continuous and free of joints in a plane extending transversely to the central axis of the tubular member throughout the length of a portion of the tubular member in which the hollow gear teeth are formed.

4,133,222

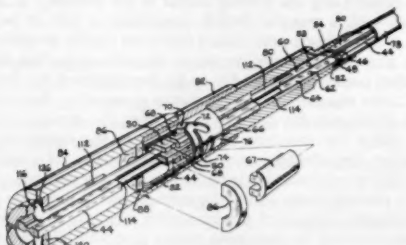
REMOTE CONTROLLER

Richard A. Dooley, 400 S.Westwood Ave., Toledo, Ohio 43609

Filed Oct. 19, 1977, Ser. No. 843,516

Int. Cl.[2] **F16C** *1/10;* **F16H** *1/04;* **B66F** *3/02*

U.S. Cl. 74—501 R **20 Claims**

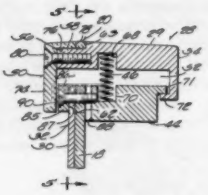


1. In a remote controller comprising a center race, two outer races, a ball guide carrying a plurality of balls between said center race and each of said outer races, flexible sheath means surrounding said outer races, and anchor means at ends of at least one of said outer races to enable at least the one outer race to take a reaction load, the improvement comprising elongate elements affixed to common ends of said ball guides and extending longitudinally beyond the common ends of said guides, and means movable with said elongate elements for controlling movement of said ball guides to prevent said ball guides from contacting the anchors of said controller.

4,133,223
SINGLE LEVER CONTROL

Anthony P. Prince, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Aug. 12, 1977, Ser. No. 824,041
Int. Cl.[2] G05G 5/06, 9/00
U.S. Cl. 74—538 10 Claims

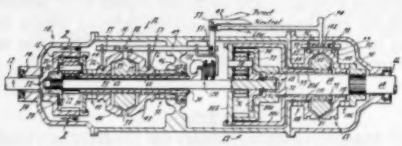


10. A single lever control comprising a main control lever having an upper end and opposed sides and being mounted for rotational movement relative to a neutral position, locking means for releasably locking said main control lever in the neutral position, including a portion which is movable between a locking position and a released position, a control knob including a laterally extending hand grip portion and a lockout button located adjacent said hand grip portion and movable relative thereto between a locking position and a released position, and means for removably fastening said control knob on said upper end of said main control lever and for removably fastening said locking means portion on said lockout button whereby said control knob can be located on either of said opposite sides of said main control lever with a major portion of said hand grip portion and said lockout button extending laterally outwardly therefrom.

4,133,224
SEMI-AUTOMATIC TRANSMISSIONS

Alfred P. Blomquist, Farmington Hills, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Jul. 29, 1977, Ser. No. 820,172
Int. Cl.[2] F16H 3/44
U.S. Cl. 74—750 R 6 Claims



1. A transmission having power input means; a first output shaft adjacent the input means and extending away therefrom; a second output shaft axially aligned with the first output shaft and extending away therefrom; first and second planetary gear sets interconnecting the input means and the first output shafts and the first and second output shafts, respectively, for transmitting torque therebetween, the gear sets each comprising rotatable members including sun and ring gears and a planet carrier with planet gears; first and second selectively engageable clutch means and third and fourth substantially engageable clutch means for cooperating at selected times with members of the first and second planetary gear sets, respectively, to control the rotation thereof;

the first clutch means selectively forming a connection between a first member of the planetary gear set, which is connected to the input means, and a second member of the planetary gear set; the first clutch means comprising axially fixed rotary clutch means connected to the second member of the planetary gear set for rotation therewith, a clutch reaction member and an axially movable rotary clutch member positioned between the clutch reaction member and the fixed rotary clutch means; the clutch reaction member being axially aligned with the movable rotary clutch member and connected to the first planetary gear member for rotation therewith; the axially movable rotary clutch member being adapted for selectively establishing the connection between the first and second members of the planetary gear set by selective engagement with the axially fixed rotary clutch means and by continual engagement between the movable clutch member and the clutch reaction member at adjacent end portions thereof as provided by a plurality of complementary, radially distributed, overlapping helical camming surfaces on the adjacent engaging end portions, the surfaces extending therebetween in mutual overlapping relationship over the complete range of axial movement of the axially movable clutch member to couple the two members together whereby rotation of one member relative to the other causes driving engagement between the corresponding complementary camming surfaces;

the second clutch means selectively forming a connection between ground and the second member of the planetary gear set whereby rotation of the second member of the planetary gear set is prevented; the second set of clutch members comprising axially fixed rotary clutch means connected to the second member of the planetary gear set for rotation therewith, a clutch reaction member and an axially movable rotary clutch member positioned between the clutch reaction member and the fixed rotary clutch member, the clutch reaction member being axially aligned and grounded against rotation; the axially movable rotary clutch member being adapted for establishing connection between ground and the second member of the planetary gear set by selective engagement with the axially fixed rotary clutch means and by continual engagement between the movable clutch member and the clutch reaction member at adjacent end portions thereof as provided by a plurality of complementary radially distributed, overlapping helical camming surfaces carried on the adjacent engaging end portions of the two clutch members, the surfaces extending therebetween in mutual overlapping relationship over the complete range of axial movement of the axially movable rotary clutch member whereby partial rotation of the axially movable rotary clutch member causes locking engagement between the corresponding complementary camming surfaces and locks the second member of the planetary gear set against rotation; the second planetary gear set being carried by the first output shaft near the end thereof adjacent the second output shaft, the sun gear of the second planetary gear set being fixed to the first output shaft, the ring gear thereof being fixed to the second output shaft for rotation therewith, the third and fourth selectively engageable clutch means being carried by the second output shaft;

the third clutch means comprising axially fixed rotary clutch means connected to and rotatable with the planet carrier, a clutch reaction member axially aligned with the fixed rotary clutch member and attached to ground and locked against rotation and an axially movable rotary clutch member positioned between the axially fixed rotary clutch member being adapted for selectively establishing connection between the planet carrier and ground by selective engagement with the axially fixed rotary clutch means and by continual engagement between the clutch reaction member and the axially movable rotary clutch member at adjacent end portions thereof as provided by a plurality of complementary radially distributed, overlapping helical camming surfaces on the adjacent engaging end portions, the surfaces extending therebetween in mutual overlapping relationship over the complete range of axial movement of the axially movable rotary clutch member whereby partial rotation of one member and engagement of the axially movable clutch member with the axially fixed rotary clutch means causes locking engagement between the camming surfaces and thereby locks the planet carrier against rotation, and

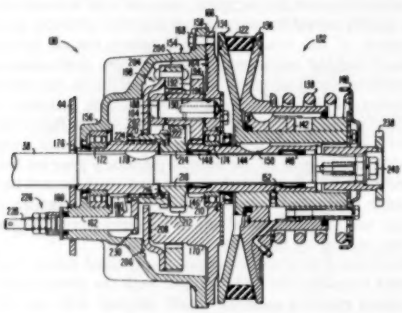
the fourth clutch means comprising axially fixed rotary clutch means connected to and rotatable with the planet carrier, clutch reaction member axially aligned with the fixed rotary clutch member and fixed to the second output shaft for rotation therewith and an axially movable rotary clutch member positioned between the axially fixed rotary clutch member and the clutch reaction member and rotatable about the second output shaft; the axially movable rotary clutch member being adapted for selectively establishing connection between the ring gear and the planet carrier by selective engagement with the axially fixed rotary clutch means and by continual engagement between the axially movable rotary clutch member and the clutch reaction member at adjacent end portions thereof as provided by a plurality of complementary radially distributed, overlapping helical camming surfaces on the adjacent engaging end portions, the surfaces extending therebetween in mutual overlapping relationship over the complete range of axial movement of the axially movable rotary clutch member thereby partial rotation of one member causes driving engagement between the camming surfaces of both members and the ring gear and planet carrier thereby rotate together upon rotation of the first output shaft.

4,133,225

VARIABLE SPEED REVERSIBLE DRIVE FOR A HARVESTING APPARATUS

Mahlon L. Love, Osco, Ill., assignor to Deere & Company, Moline, Ill.

Division of Ser. No. 735,378, Oct. 26, 1976. This application Nov. 21, 1977, Ser. No. 853,024
Int. Cl.[2] F16H *3/44*
U.S. Cl. 74—750 R **2 Claims**



1. An improved speed reducing and direction reversing planetary gear unit comprising:

a rotatable power transmission shaft;

a sun gear mounted on the shaft;

a housing journaled on the shaft and having at least one pair of internal generally radial opposing abutments;

a planetary pinion set carried by the housing and including a plurality of pinion gears drivingly engaging the sun gear;

a ring gear encircling the planetary pinion set, drivingly engaging and radially positioned by the pinion gears and extending between and axially positioned by the radial abutments of the housing; and

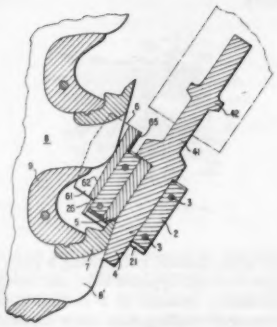
means for selectively coupling the shaft either to the sun gear or to the ring gear so that in operation the shaft and the sun gear either turn together or in opposite directions respectively.

4,133,226

SAW BIT SWAGE

Joseph Torch, 45 Clark Ave., Carbondale, Pa. 18407

Filed Aug. 3, 1977, Ser. No. 821,509
Int. Cl.[2] B23D *63/06*
U.S. Cl. 76—56 **8 Claims**



1. A tool for swaging saw teeth comprising, in combination: means defining a recess for receiving the tip of a saw tooth and shaped to the desired final configuration of that tooth, said means being made of a hardened material; tool guide means adjustable in position, and fixable in any selected position, relative to said recess-defining means and arranged to cooperate with a portion of the associated saw for establishing a selected orientation between said recess-defining means and the tooth to be swaged, said tool guide means comprising two longitudinally extending, parallel flanges spaced apart by a distance substantially equal to the thickness of such saw portion and arranged to receive such saw portion when a saw tooth is inserted in the recess, in order to prevent twisting of said tool about its longitudinal axis, and tilting of said tool perpendicular to the planes of said flanges, during swaging, said tool guide means further presenting a bottom surface extending between said flanges and arranged to bear against a peripheral edge of such saw portion when said tool is in position to perform a swaging operation; and impact force delivery means rigidly connected to said recess-defining means for delivering to said recess-defining means impact forces in the direction toward a tooth inserted in the recess.

4,133,227

DIRECT MACHINING METHOD OF MANUFACTURE OF ISOSTRESS CONTOURED DIES

John J. Crowe; Leslie C. Kun, both of Williamsville, and George E. Nies, East Aurora, all of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed May 18, 1977, Ser. No. 798,150
Int. Cl.[2] B21K *5/20*
U.S. Cl. 76—107 R **10 Claims**

1. A method for forming an isostress-contoured die from a metal workpiece, comprising the steps of:

(a) forming from said workpiece a plurality of outwardly extending, spaced-apart truncated conoidal projections with concavely shaped side wall portions surrounded by flat planar surface portions, wherein said projections are arranged in repetitive diamond-shaped patterns having

projections disposed at the apices thereof, such that respective pairs of adjacent projections in each diamond pattern are common with an adjacent diamond pattern with each diamond pattern having a minor axis D_1 and a major axis D_2 defined by center-to center distances between oppositely disposed projections of the pattern, with each projection having a substantially flat top surface of equivalent diameter d and a circular base at the juncture of the projection with the surrounding planar surface portions, and with the substantially flat top surfaces of said projections in a common plane parallel to the plane defined by said flat planar surface portions of said workpiece, the forming step being carried out such that the dimensional relationship between the diamond pattern minor axis D_1, major axis D_2 and projection flat top equivalent diameter d is defined by

$$D_1 \geqq 0.2 \text{ inch}$$

$$0.2 \leqq \frac{(D_1^2 + D_2^2)^{\frac{1}{2}}}{2} \leqq 2.5 \text{ inches, and}$$

$$3 \leqq \frac{(D_1^2 + D_2^2)^{\frac{1}{2}}}{2d} \leqq 10: \text{ and}$$

(b) machining depressions in the workpiece surface portions associated with each said diamond pattern, each said depression having a perimeter which is at least partially circular with a circular perimetral portion tangent to at least one major axis projection of the diamond pattern at the base thereof, with the center of curvature of said circular perimetral portion lying on said major axis D_2 of said diamond pattern, and with said depression having a generally arcuate curved contour extending from said major axis projections in a plane containing the major axis line and perpendicular to the minor axis line, such that adjacent depressions overlap one another and ridges are formed between the adjacent depressions on the surface of said workpiece, and machining said ridges between adjacent depressions for at least partial reduction thereof, to form workpiece surface portions between and surrounding said projections which are continuously curved in contours of depth H, wherein H is the maximum distance measured perpendicularly from said plane defined by the substantially flat top surfaces of the projections enclosing the curved contour to the innermost crest of the contour, and the dimensional relationship between the contours and said projections is defined by

$$0.05 \leqq \frac{2H}{(D_1^2 + D^2_2)^{\frac{1}{2}}} \leqq 0.2$$

4,133,228

PULL TAB OPENER

Clarence E. DePooter, 239 6th St. Ct., Andalusia, Ill. 61232

Filed Jul. 1, 1977, Ser. No. 812,236

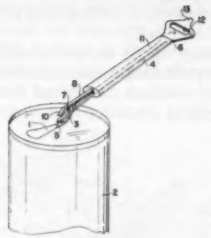
Int. Cl.² B67B *7/44*

U.S. Cl. 81—3.1 R **1 Claim**

1. A pull tab opening tool for removing a pull tab from a can, said pull tab having an enclosed ring-like part, said pull tab opening tool comprising

an elongated shaft-like member having spaced opposite first and second ends, with a groove formed therein in the area of the first end thereof extending transversely to the member, said groove accommodating the ring-like part of a pull tab;

a substantially resilient strip of material having spaced opposite first and second ends, said strip of material being affixed at its first end to the shaft-like member at a point between the groove and the second end of said member, extending substantially parallel to said member and over said groove and abutting at its second end said member at a point between said groove and the first end of the said member for retaining the tab in the groove; and



a cap removing device extending from the second end of the member.

4,133,229

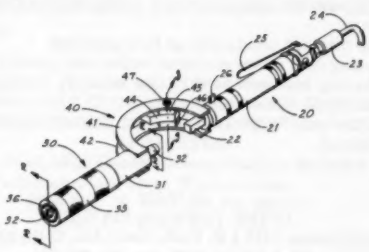
IMPACTING APPARATUS

Carl A. Grenci, 4791 Lesa Pl., Yorba Linda, Calif. 92686

Filed Feb. 19, 1976, Ser. No. 659,542

Int. Cl.² B25B *19/00*

U.S. Cl. 81—52.3 **6 Claims**



1. An impacting apparatus for loosening valve protective caps on the necks of compressed gas cylinders and cylinder valves in the necks of such cylinders comprising:

a hammer assembly including a housing and a driven, vibratory ram extending axially from said housing and being operative to reciprocate axially relative thereto;

an anvil assembly including a housing and an anvil extending axially from said housing; and

means for connecting said anvil assembly housing to said hammer assembly housing with said anvil in facing, spaced, co-axial relationship to said ram, the axial position of said anvil being manually adjustable relative to said anvil assembly housing between a first position in which said anvil and said ram are spaced sufficiently to receive therebetween a valve protection cap secured to the neck of a large compressed gas cylinder and a second position in which said anvil and said ram are closely adjacent opposite sides of the neck of a small compressed gas cylinder.

4,133,230

MACHINE TOOL

Seiuemon Inaba; Tokiji Shimajiri, both of Kawasaki, and Shigeaki Oyama, Hachioji, all of Japan, assignors to Fujitsu Fanuc Limited, Japan

Filed May 31, 1977, Ser. No. 801,572

Claims priority, application Japan, Jun. 1, 1976, 51-70728[U]; Jun. 1, 1976, 51-70729[U]

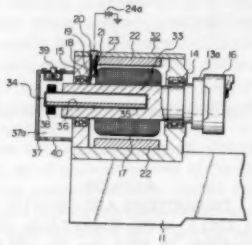
Int. Cl.² B23B *19/02*

U.S. Cl. 82—28 R **2 Claims**

1. A machine tool, comprising:

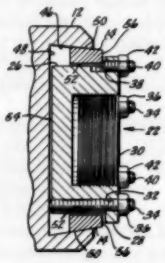
a bed;

a head stock mounted on said bed;
a main spindle rotatably mounted on said head stock, said main spindle being provided with a conduit constructed integrally therewith, extending outwardly therefrom, and terminating in an end;
armature windings rigidly secured to said main spindle;
field means for producing a magnetic field arranged around said armature windings and spaced therefrom;
means for supplying electric power to said armature windings;



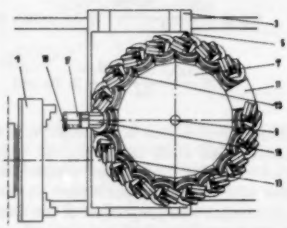
an air flow chanber having at least one air shot, said end of said conduit being positioned within said air flow chamber;
a fan mounted within said air flow chamber;
working fluid means contained within said conduit for conducting heat generated in said armature windings from said main spindle; and
at least one fin provided on said conduit near said end thereof.

4,133,231
LATHE TURNING FIXTURE
Richard Corona, 1217 ½ E. Fruit, Santa Ana, Calif. 92703
Filed Jul. 14, 1977, Ser. No. 815,644
Int. Cl.² B23B *19/02, 23/02*
U.S. Cl. 82—28 R **8 Claims**



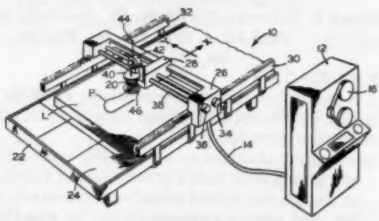
1. In a machine lathe turning fixture for use with a lathe having a chuck with multiple jaw members simultaneously positionable with respect to the chuck face to engage a workpiece, the combination comprising:
a base member having a main body portion and a flange portion, the main body portion being configured for retention by the chuck with the surface of said body portion in spaced proximate relation to the chuck face with said flange portion in spaced proximate relation to the edges of the jaws of the chuck;
workpiece receiving means on said base member;
first adjustment means extending through said base member for engaging the chuck face for angularly adjusting the position of said base member with respect to said chuck face; and
second adjustment means extending through said base member adjacent said flange portion for engaging the edges of the jaws of said chuck for angularly adjusting the position of said base member with respect to the jaws whereby to permit the adjustment of the axis of rotation of the workpiece along at least two angularly displaced lines in a plane perpendicular to the axis of rotation of the workpiece.

4,133,232
LATHE TURRET
Ernst Studinger, Berlin-Lichterfelde-Ost, Fed. Rep. of Germany, assignor to Carl Hasse & Wrede GmbH, Berlin, Fed. Rep. of Germany
Filed Mar. 11, 1977, Ser. No. 776,926
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1976, 2610105
Int. Cl.² B23B *29/00, 39/20*
U.S. Cl. 82—36 A **4 Claims**



1. In a turret for a lathe having a head stock, a substantially circular pivotable turret member in front of the head stock of the lathe, a plurality of support surfaces on the periphery of said turret member and said support surfaces each inclined at an angle of 45° with respect to the axis of rotation of the turret member, a plurality of tool supports pivotally mounted on said support surfaces, pivot pins for said tool supports disposed perpendicular to the supporting surfaces, the longitudinal axes of the tool supports each defines an angle of 45° with its pivot axis.

4,133,233
PROGRAMMED METHOD AND APPARATUS FOR CUTTING SHEET MATERIAL WITH A SHARPENABLE BLADE
David R. Pearl, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., South Windsor, Conn.
Filed Nov. 29, 1977, Ser. No. 855,796
Int. Cl.² D06H *7/00;* **B26D** *5/30, 7/12*
U.S. Cl. 83—56 **14 Claims**



10. A method of operating a programmed machine for cutting limp sheet material with a sharpenable blade comprising;
spreading the limp sheet material on a support surface;
positioning a sharpenable cutting blade above the sheet material on a support surface with the cutting edge in

predetermined relationship with a tool axis perpendicular to the support surface;

moving the sheet material and the sharpenable blade relative to one another with the cutting edge of the blade in engagement with the material to move the tool axis relative to the material along a cutting path between points defining the programmed path to cut the sheet material accordingly;

sharpening the cutting edge of the blade periodically to maintain a sharp cutting edge on the blade as the sheet material is cut; and then

extending the relative movement of the tool axis and the sheet material between two successive points on the path by a predetermined amount beyond the second point in a direction defined by the two points to compensate for wear of the cutting edge on the blade caused by the sharpening.

4,133,234

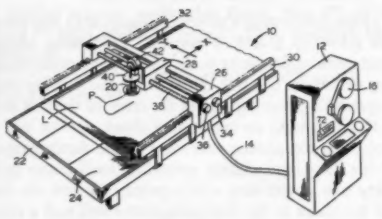
METHOD AND APPARATUS FOR CUTTING SHEET MATERIAL WITH IMPROVED ACCURACY

Heinz J. Gerber, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., South Windsor, Conn.

Filed Apr. 22, 1977, Ser. No. 790,035

Int. Cl.[2] D06H *7/00*; B26D *5/00*; B26F *1/38*

U.S. Cl. 83—56 **9 Claims**



1. A method of cutting pattern pieces from sheet material by means of a cutting blade having a leading cutting edge and a trailing edge comprising:

moving the sheet material and cutting blade relative to one another to advance the blade with the leading cutting edge in front along a selected cutting path having curvatures at various points along the path; and

orienting the advancing cutting blade about an axis within the blade and extending generally perpendicular to the sheet material in accordance with the direction of the cutting path at each point along the path and in accordance with an additional increment of angular rotation calculated from the curvature of the cutting path at the respective points.

4,133,235

CLOSED LOOP APPARATUS FOR CUTTING SHEET MATERIAL

Heinz J. Gerber, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., South Windsor, Conn.

Filed Apr. 22, 1977, Ser. No. 790,149

Int. Cl.[2] B26D *5/00*; B26F *1/38*; D06H *7/00*

U.S. Cl. 83—74 **23 Claims**

1. An automatically controlled cutting machine for accurately cutting limp sheet material comprising:

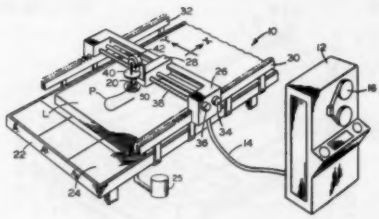
a cutting blade;

a cutting table defining a support surface on which sheet material is positioned in a spread condition for cutting by the cutting blade;

motor means for moving the cutting blade and the sheet material relative to one another in cutting engagement;

control means connected with the motor means and providing control signals to the motor means for guiding the cutting blade through the material along a predetermined cutting path;

sensing means operatively associated with the cutting blade and sheet material for detecting lateral forces applied to the blade by the material as the blade advances through the material in cutting engagement, the sensing means also



producing a signal corresponding to the detected lateral forces; and

feedback means interconnecting the sensing means and the control means for generating additional control signals to regulate the cutting of the material by the blade along the predetermined cutting path in response to the detected forces.

4,133,236

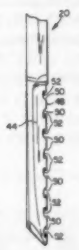
SHARPENABLE CUTTING BLADE WITH SKEW-CUT NOTCHES FOR USE IN SHEET MATERIAL CUTTING APPARATUS

David R. Pearl, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., South Windsor, Conn.

Filed Nov. 29, 1977, Ser. No. 855,797

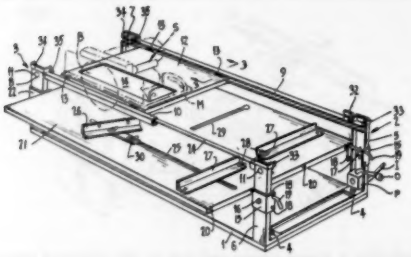
Int. Cl.[2] B26D *1/10, 7/12*

U.S. Cl. 83—174 **20 Claims**



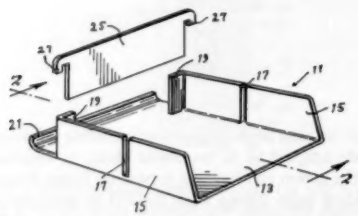
1. In sheet material cutting apparatus including an elongated cutting blade adapted to be translated along its longitudinal axis in cutting action and havng a forwardly facing longitudinally extending main cutting edge defined by and between a pair of acutely angularly related and intersecting surfaces, means for effecting longitudinal translation and lateral advancement of the cutting blade through sheet material in cutting engagement therewith and along a predetermined cutting path, blade sharpening means engageable with each of said longitudinal edge defining surfaces on the blade, and means for effecting relative longitudinal movement between the blade and sharpening means for sharpening said longitudinal main cutting edge, the improvement comprising at least two short auxiliary cutting edges on said blade each extending generally laterally rearwardly from said longitudinal main edge and each being half-defined by a main edge defining surface so as to be sharpened simultaneously with said main edge during engagement and relative movement between said sharpening means and said surface.

4,133,237
WORK TABLE FOR SAWS AND OTHER TOOLS
George Lewin, 21 Norman St., McKinnon, 3204, Victoria, Australia
Filed Oct. 19, 1977, Ser. No. 843,650
Int. Cl.[2] B27B 5/18
U.S. Cl. 83—467 R 8 Claims



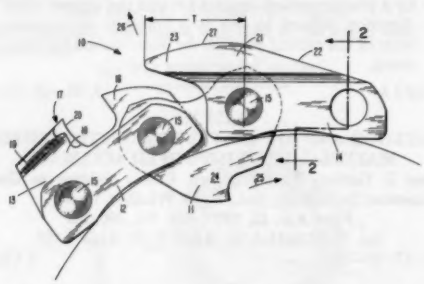
1. A work table for a saw comprising, a pair of spaced horizontally extending guide members secured to support members in a position that is raised from a support surface, a saw supporting plate engaged with and guided by said guide members for movement in a horizontal plane, a work supporting plate having an elongated slot which in use receives the saw blade of a saw secured to said saw supporting plate, and means on said guide support members for securing said work support plate in alternative positions below said saw supporting plate in which the work table can operate in a docking saw mode and above said saw supporting plate with the saw blade adapted to project upwardly through said slot in which the work table can operate in use in a bench saw mode, and means on said table for preventing movement of said saw supporting plate relative to said guide members when the table is in the bench saw mode.

4,133,238
FOOD-HANDLING DEVICE
Jacob L. Jacobs, 2628 - Youngstown-Lockport Rd., Ransomville, N.Y. 14131
Filed Jul. 5, 1977, Ser. No. 812,488
Int. Cl.[2] B26D 7/00
U.S. Cl. 83—762 6 Claims



1. A food-handling device suitable for holding a sandwich and for assisting in the insertion of a sandwich into an open-ended container which comprises a generally rectangular tray, said tray having a bottom, opposed, fixed, upstanding side walls, and open ends; each of said side walls having, adjacent one of said ends, an inwardly-directed extension, partially closing said one end, said extensions being laterally aligned, and each of said side walls having a vertical slot extending from the top thereof to substantially the bottom thereof between said inwardly-directed extension and the other end, said slots being adapted to receive the blade of a knife, and said side walls at said other ends being bevelled whereby to facilitate entry of said tray into a container; and a detached end plate adapted to fit between said side walls and engage said extensions and movable lengthwise of said tray between said side walls to expel a sandwich from said tray into said container.

4,133,239
KICKBACK-FREE SAW CHAIN
Lawrence Goldblatt, Hamilton, Canada, assignor to Jessie Goldblatt, Hamilton, Canada
Filed Jun. 17, 1977, Ser. No. 807,658
Int. Cl.[2] B27B 33/14
U.S. Cl. 83—834 5 Claims

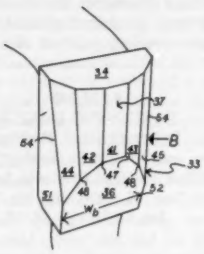


1. A saw chain comprising a series of center links and pairs of side links pivotally joined to form an articulated chain; certain of said pairs of side links being cutter pairs comprising a non-cutting tie link on one side of the chain and a cutter link bearing an upstanding depth gauge at the front of the link and a cutter tooth comprising an upstanding shank portion and a laterally projecting toe portion rearward of the depth gauge; the pair of side links immediately preceding each cutter pair being a safety pair comprising a non-cutting tie link on the same side of the chain as the following cutter link and a non-cutting safety link on the opposite side of the chain from the following cutter link; said safety link comprising an upstanding cam portion having an upwardly and rearwardly inclinded leading edge and a rearwardly projecting tail, said tail being configured to pivot outwardly as the chain traverses the rounded nose of a saw bar to reduce the effective depth gauge setting of the following cutter to a value less than one-half the normal depth gauge setting when the chain is travelling along the straight portion of the saw bar, the upper surface of the tail of the safety link being a continuous, smooth curve having a radius of curvature from 1.7 to 2.2 times the pitch length of the safety link, the length of the tail of the safety link being at least approximately equal to the pitch length of the following center link.

4,133,240
CUTTING TEETH FOR CIRCULAR SAW BLADES
Erwin H. Vollmer, Balmerstrassa, Fed. Rep. of Germany, and George J. Vollmer, Sewickley, Pa., assignors to Vollmer of America Corporation, Pittsburgh, Pa.
Filed Sep. 6, 1977, Ser. No. 830,673
Int. Cl.[2] B27B 33/08
U.S. Cl. 83—848 4 Claims

1. A low cutting tooth for use in combination with a raker tooth in circular saw blades comprising a leading face and a top, said leading face including a first planar surface and a second portion consisting of a first center facet inclined at a negative angle from the first planar surface to the top, second and third facet, each positioned adjacent to the first facet and lying in a plane angularly offset from the plane of first facet by a first angle to define first cutting edges, and fourth and fifth facets positioned adjacent said second and third facets respectively, each lying in a plane angularly offset from the plane of

the first facet by second angle to define second cutting edges, said fourth and fifth facets defining third cutting edges with the



associated side of the tooth, and each of said sides has a radial clearance angle β.

4,133,241
ELECTRONIC MUSICAL INSTRUMENT UTILIZING RECURSIVE ALGORITHM

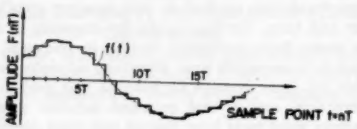
Koji Niimi, Hamamatsu; Michiaki Kumaoka, Shizuoka, and Takashi Yamada, Hamamatsu, all of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

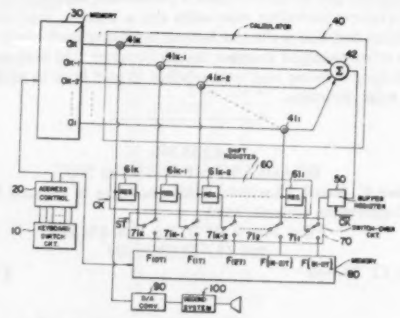
Filed May 25, 1976, Ser. No. 689,867

Claims priority, application Japan, May 27, 1975, 50-63217; May 27, 1975, 50-63218; May 27, 1975, 50-63219; May 27, 1975, 50-63220

Int. Cl.² G10H *1/00*

U.S. Cl. 84—1.01 **28 Claims**





1. A musical instrument comprising:

a first means for calculating the amplitudes at successive sample points of a waveshape according to a recursive algorithm, using, at least for some sample points, the amplitudes at a plurality of the preceding calculated sample points to determine the values of said successive sample points according to the same identical formula for each calculation;

a second means for temporarily storing said preceding amplitudes; and

a third means for converting said successive sample point amplitudes calculated by said first means to a musical tone corresponding to said waveshape.

4,133,242
WAVESHAPE MEMORY TYPE ELECTRONIC MUSICAL INSTRUMENT

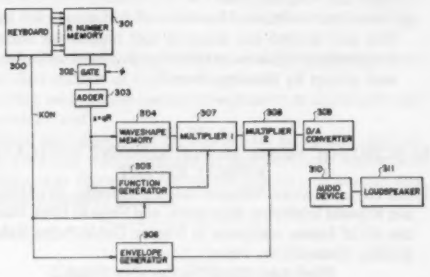
Yohei Nagai, and Shimaji Okamoto, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 2, 1977, Ser. No. 773,787

Claims priority, application Japan, Mar. 5, 1976, 51-23796

Int. Cl.² G10H *1/02, 5/00*

U.S. Cl. 84—1.13 **9 Claims**



1. A waveshape memory type electronic musical instrument including a waveshape memory which stores sample values of a waveshape defining a cycle of the waveshape, and producing a tone wave signal by repeatedly reading said sample values to constitute said waveshape at a frequency determined by the pitch of a tone to be sounded, the electronic musical instrument comprising:

a function generator for generating a function wave signal; and

means for modulating such ones of the read-out sample values that constitute a fractional part of said cycle of the waveshape of said tone wave signal generated from said waveshape memory by said function wave signal.

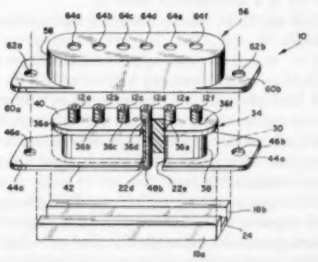
4,133,243
ELECTRIC PICKUP

Lawrence P. DiMarzio, 210 Davis Ave., Staten Island, N.Y. 10310

Filed Aug. 11, 1977, Ser. No. 823,687

Int. Cl.² G10H *3/08*

U.S. Cl. 84—1.15 **10 Claims**



1. A magnetic pickup for a stringed musical instrument employing a plurality of metallic strings comprising:

(a) a plurality of unhardened cylindrical ferrometallic pole pieces at least equal in number to the number of said metallic strings;

(b) said pole pieces being externally threaded;

(c) non-metallic holding means for holding a first end of each said pole pieces adjacent said strings;

(d) a winding of a plurality of turns of insulated wire on said

means for holding, said winding enclosing all of said pole pieces;

(e) cylindrically symmetrical adjustment means in the first ends of said pole pieces;

(f) the second ends said pole pieces extending outward from said means for holding;

(g) first and second spaced apart bar magnets disposed on either side of said second ends;

(h) like polarities of said first and second bar magnets facing said second ends of said pole pieces;

(i) a ferrometallic keeper touching and bridging said spaced apart bar magnets; and

(j) threaded means in at least one of said means for holding, first and second bar magnets and keeper for threadable longitudinal adjustment of said pole pieces with respect to said strings by rotation thereof.

4,133,244

ELECTRONIC MUSICAL INSTRUMENT WITH ATTACK REPEAT EFFECT

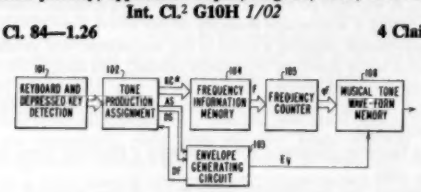
Teruo Hiyoshi; Akira Nakada; Shigeru Yamada, all of Hamamatsu; Kiyoshi Ichikawa, Hamakita, and Shigeki Ishii, Hamamatsu, all of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Aug. 13, 1976, Ser. No. 714,083

Claims priority, application Japan, Aug. 21, 1975, 50-101599

Int. Cl.[2] G10H *1/02*

U.S. Cl. 84—1.26 **4 Claims**



1. A polyphonic electronic musical instrument having an attack repeat effect, comprising:

a set of tone selection keys;

a single tone generator for producing a musical tone in accordance with a key code specifying the frequency of that tone;

tone production assignment means for storing the key codes of one or more tones selected by depression of said keys and for repeatedly, sequentially supplying said stored key codes to said single tone generator in consecutive time slots corresponding to a plurality of channels so that said single tone generator thereby produces said one or more tones in a time-shared fashion;

a single envelope memory storing a predetermined envelope shape;

read out means for reading out said envelope shape from said single envelope memory individually with respect to each of said plurality of channels in synchronism with said consecutive slots, said read out means comprising a time shared counter of modulo m, where m corresponds to the number of storage addresses in said envelope memory, said counter having;

a shift register having a number of stages corresponding to the number of said channels, each stage being capable of storing an address code for said envelope memory, one stage of said shift register being connected to said read out means so that said envelope memory is read out at the address provided from said connected one stage, said shift register being shifted in unison with occurrence of each channel-corresponding time slot;

an envelope clock pulse source; and

adder means, connected between the output stage and the input stage of said shift register to reenter the address code from said output stage back into said input stage, for incrementing the reentered address code upon occurrence of a pulse from said envelope clock pulse source, each stage of said shift register being reset to zero each time that it has been incremented to a count of m; and

envelope control means, connected to said read out means and to said tone generator, for controlling the amplitude envelope of each produced musical tone in accordance with the corresponding read out envelope shape.

4,133,245

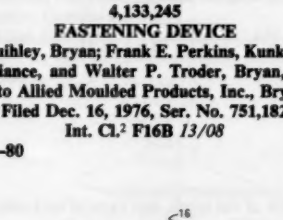
FASTENING DEVICE

Robert E. Ruihley, Bryan; Frank E. Perkins, Kunkle; Robert W. Arps, Defiance, and Walter P. Troder, Bryan, all of Ohio, assignors to Allied Moulded Products, Inc., Bryan, Ohio

Filed Dec. 16, 1976, Ser. No. 751,182

Int. Cl.[2] F16B *13/08*

U.S. Cl. 85—80 **21 Claims**



1. A fastener comprising a tubular member having opposite ends, enlarged means adjacent said member ends, respectively, for cooperating with a bore in which said tubular member is positioned to prevent said member from being dislodged from said bore by forces applied to said member axially of said member and bore, flexible means for engaging a stud, said flexible means being resiliently flexible in one axial direction and rigid in the opposite axial direction, whereby said stud is insertable into said member by pushing said stud in said one axial direction, one of said enlarged member means being substantially rigid in at least one of said axial directions, the other of said enlarged member means including wedging surfaces, said bore having an enlarged end portion in which said other enlarged member means is positioned, said enlarged bore end portion including side walls and a bottom, said wedging surfaces and side walls and bottom engaging each other to jam said other enlarged member means between said bore and said stud upon moving said stud relative to said bore in said opposite axial direction.

4,133,246

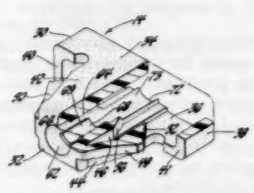
HEADLAMP ADJUSTING NUT

Robert C. Small, Charlotte, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 9, 1977, Ser. No. 804,893

Int. Cl.[2] F16B *13/04*

U.S. Cl. 85—80 **3 Claims**



1. A screw and nut assembly for adjustably positioning a headlamp unit relative to a support plate so as to realize proper optical aim for the headlamp unit, comprising a one-piece nut

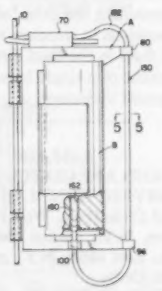
member made of a plastic material, said nut member having a shank axially insertable through a complementary mounting hole formed in said support plate, said shank including a body section having a front end and a rear end, said front end of the body section being generally rectangular in shape and the rear end being formed with a pair of planar surfaces inclined towards the longitudinal center axis of the nut member, a base section including top and bottom walls and a pair of laterally spaced side walls integrally formed with one end of said shank and adapted to engage one surface of said support plate, a pair of spring arms formed with the other end of said shank, said spring arms extending rearwardly along diverging axes towards said base section and being biased outwardly relative to the longitudinal center axis of said nut member, the intermediate portion of each spring arm being curved inwardly towards said longitudinal center axis and the free end of each spring arm terminating with a plurality of teeth which lie in a plane that intersects said longitudinal center axis at a point located adjacent to said base section, said spring arms being movable laterally inwardly towards said planar surfaces of the body section when the shank is inserted into said mounting hole formed in the support plate and being adapted to move laterally outwardly to have one of said teeth on each of said spring arms engage the other surface of said support plate when the base section contacts said one surface of said support plate, an adjusting screw rotatably secured to said headlamp unit, and an axial bore formed in said shank and extending through said base section between said top and bottom walls and said spaced side walls for accommodating said adjusting screw whereby rotation of the latter causes adjustable positioning of the headlamp unit relative to the support plate about an axis extending transversely to the optical axis of the headlamp unit.

4,133,247

CARRIER FOR EXPLOSIVE PRIMER AND METHOD OF USING SAME

Brooke J. Calder, Jr.; David L. Childs, both of Solon; Roger N. Prescott, Lyndhurst, all of Ohio, and Donald W. Lyons, Madisonville, Ky., assignors to Austin Powder Company, Beachwood, Ohio

Division of Ser. No. 740,799, Nov. 11, 1976. This application Jan. 3, 1978, Ser. No. 866,277
Int. Cl.[2] F42D *1/08*
U.S. Cl. 86—20 C **1 Claim**



1. A method of charging a borehole with at least first and second separated sections of explosive material, said method comprising the steps of:

(a) providing a detonating cord extending into said borehole;

(b) providing a first primer on a first carrier having an elongated first time delay element with an inlet cord and extending between said detonating cord and said first primer, said time delay element having a first selected time delay value;

(c) providing a second primer on a second carrier having an elongated second time delay element with an inlet cord and extending between said detonating cord and said first primer, said second time delay element having a second selected time delay value different from said first time delay value;

(d) maintaining said inlet cord of said first time delay element in slidable contact with said detonating cord;

(e) maintaining said inlet cord of said second time delay element in slidable contact with said detonating cord;

(f) loading said first section of explosive material into said borehole;

(g) sliding said first carrier and primer along said detonating cord and into a position in said borehole where said primer is in detonation relationship with said first section of explosive material;

(h) loading a separating non-explosive decking material over said first section of explosive material;

(i) loading said second section of explosive material into said borehole; and,

(j) sliding said second carrier and primer along said detonating cord and into a position in said borehole where said primer is in detonation relationship with said second section of explosive material.

4,133,248

SHELL CASING RESIZER

Welton E. Phillips, 1820 S. 11th Ave., Yuma, Ariz. 85364

Filed Sep. 9, 1977, Ser. No. 831,983
Int. Cl.[2] F42B *33/02*
U.S. Cl. 86—23 **21 Claims**

1. A machine for resizing used shell casings, which comprises:

a pair of cooperating die means each of which is adapted to receive a shell casing for resizing same;

means for applying force to one of said shell casings to urge same past its associated die means;

means further responsive to said force for automatically ejecting the other of said shell casings from the other of said die means; and

means coupled to said pair of cooperating die means for permitting manual indexing thereof for successively and alternately positioning each of said pair of die means adjacent said means for applying force to one of said shell casings.

4,133,249

AMMUNITION CASING RESIZER

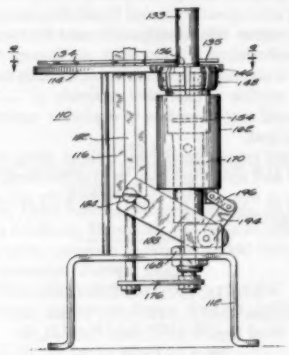
Theodore J. Bachhuber, and Philip C. Bachhuber, both of Mayville, Wis., assignors to Mayville Engineering Company, Inc., Mayville, Wis.

Continuation-in-part of Ser. No. 709,571, Jul. 28, 1976, abandoned. This application May 11, 1977, Ser. No. 795,980
Int. Cl.[2] F42B *33/02*
U.S. Cl. 86—23 **29 Claims**

1. In a resizer for the flange and tubular portion of a cartridge casing, comprising a frame, a work table mounted on said frame, means on said work table for receiving the flanged end of a plurality of casings and for moving said casings over a plurality of work stations on said work table, the improvement comprising a casing supporting member mounted under one work stations of said work table, means for producing relative motion between said casing supporting member and said work table to move said casing supporting member from a position level with the top of said table to a position below said table, a radially expandable and contractible resizing collet having a sufficiently large number of gripping fingers movable radially with respect to the axis of the collet and with respect to a casing to be re-sized so that during closing there is no substantial component of circumferential motion between any part of the respective collet fingers and a casing on which the collet fingers are being closed, said collet being mounted under said work table in position to surround a casing tubular portion and flange which is carried by said supporting member when it

is below said work table, the inner surface of said collet being shaped to resize the flange and tubular portion of said casing when said collet is contracted, and means for contracting said collet to resize said flange and tubular portion and then expanding said collet to permit said casing to be removed therefrom.

11. In a cartridge casing resizer comprising a frame, the improvement comprising a radially expandable and contractible resizing collet having a sufficiently large number of gripping fingers movable radially with respect to the axis of the



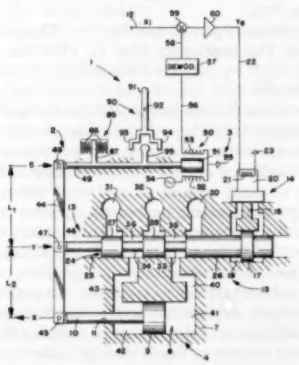
collet and with respect to a casing to be re-sized so that during closing there is no substantial component of circumferential motion between any part of the respective collet fingers and a casing on which the collet fingers are being closed said collet being mounted on said frame, said collet being dimensioned to receive the flange and tubular portion of a casing in its expanded condition and to resize said flange and tubular portion when contracted, and means for contracting said collet to resize said flange and tubular portion and then expanding said collet to permit the resized casing to be removed from said collet.

4,133,250

COMBINED FEEDBACK CONTROL SYSTEM

Richard P. Heintz, Kalamazoo, Mich., assignor to Pneumo Corporation, Boston, Mass.

Filed Jun. 22, 1977, Ser. No. 808,877
Int. Cl.[2] F15B *9/03, 9/09, 13/16*
U.S. Cl. 91—363 A **19 Claims**



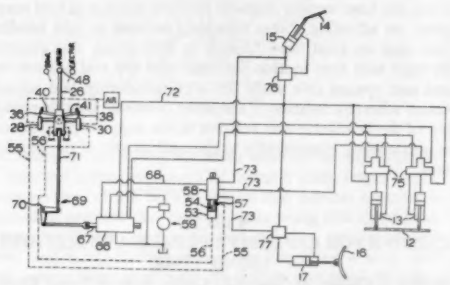
1. A servo actuator with a combined feedback control system, comprising ram means for producing a displacement output in response to a fluid input, input means for receiving a position command signal representative of a desired displacement of said ram means, electrically operable means for controlling the delivery of fluid to said ram means and, thus, the position thereof in response to an error signal, said electrically operable means including means for producing mechanical displacement information representative of the velocity of said ram means, lever means for mechanically combining displacement of said ram means and such mechanical displacement information to produce combined information thereof, transducer mens responsive to such combined information for producing an electrical feedback signal representative of such combined information, and combining means for electrically combining such position command signal and such feedback signal to develop such error signal.

4,133,251

SINGLE LEVER CONTROL APPARATUS

Richard W. Agge, Decatur, and Kenneth W. Kelly, Warrensburg, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 28, 1977, Ser. No. 772,399
Int. Cl.[2] F16K *11/18*; G05G *9/04*
U.S. Cl. 91—521 **17 Claims**



1. In a mechanism of a work vehicle having a fluid circuit and first, second and third fluid actuated work elements each selectively and controllably movable between a first position at which said work element is fully retracted and a second position at which said work element is fully extended, the improvement comprising:

a single lever means for controllably moving a selected one of said work elements between said first and second positions and maintaining the other of said work elements in preselected positions in response to controllably directing a pressurized fluid in the fluid circuit in response to controlled movement of a single lever of said lever means in only two opposed directions.

4,133,252

METHOD AND APPARATUS FOR SECURING CARRYING HANDLES TO BAGS

Ernest Eckstein, 69 Cross Hwy., West Port, Conn. 06880; Anton Helmle, Yonkers, N.Y.; Jordan Perlin, Roslyn, N.Y., and Irving Spitalnik, East Hills, N.Y., assignors to Ernest Eckstein, West Port, Conn.

Filed May 11, 1976, Ser. No. 685,325
Int. Cl.[2] B31B *37/74*
U.S. Cl. 93—35 H **21 Claims**

1. Apparatus for securing handles onto bags which are open at their top portions and closed at their sides and bottoms, said apparatus comprising:

a. first means for sequentially transporting a stream of bags;

b. second means for engaging the bags and operating thereon through a series of operations;

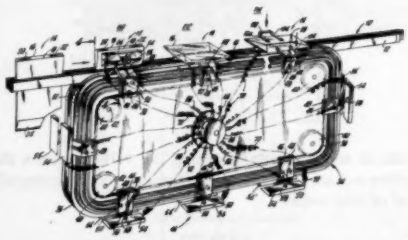
c. third means for attaching handles to the bags during one of said operations;

d. said second means including at least one pair of cooperat-

ing heads arranged to be moved during said series of operations;

e. each head of said pair including suction means moving therewith for grasping a portion of a bag at a first operation and releasing the portion of the bag at a subsequent operation, each of said suction means of said pair of heads including a vacuum plate to provide a pair of vacuum plates coacting together for grasping and releasing opposing outer bag walls at the top portion thereof;

f. said pair of heads further including control means for controlling the movement of said vacuum plates between a closed and an open position in order to open the top portion of the bag and fold back the top portion to a



common plane to expose opposite inner wall surfaces thereof at an operation intermediate said first and said subsequent operations, said pair of vacuum plates opposing each other when in said closed position and lying adjacent each other in said common plane when in said open position; and

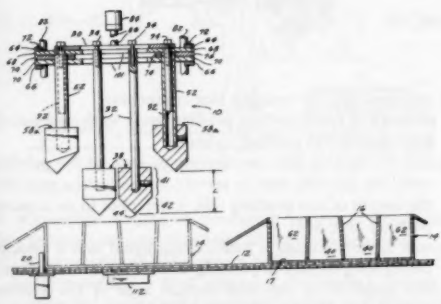
g. said third means for attaching handles including fastening means for securing the handles directly to an inside mouth of the bag on said opposite inner wall surfaces thereof as the top portion of the bag rests against said vacuum plates in said open position, said vacuum plates acting as support means for supporting said fastening means when the handles are being secured to the bag.

4,133,253

PARTITION POSITIONER

William C. Butt, Lynchburg, Va., assignor to Simplimatic Engineering Company, Lynchburg, Va.

Filed Dec. 2, 1977, Ser. No. 856,612
Int. Cl.² B31D *3/04*
U.S. Cl. 93—37 R **18 Claims**



1. Apparatus for positioning partitions in a container to form compartments to receive articles comprising:

A. first and second assemblies, each of said assemblies comprising support means and at least one mandrel secured to said support means, extending therefrom in a given direction towards the container bottom, and terminating in a head adapted to align and straighten the partitions in the container to form compartments for the receipt of articles;

B. means for securing said first assembly to said second assembly in a manner permitting relative motion therebetween between first and second relative positions, the mandrels of said first assembly extending in said given direction for a given direction beyond the mandrels of said second assembly when said assemblies are in said first relative position, movement of said assemblies to said second relative position resulting in a lessening of said given distance, said mandrels collectively being arranged in a pattern related to a desired compartment pattern in the container; and

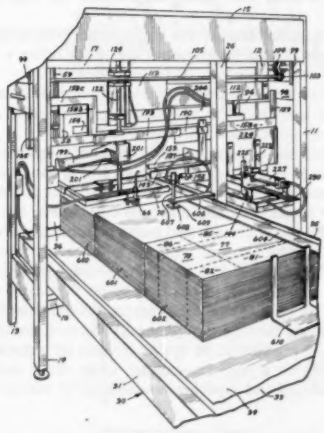
C. means for moving said first and second assemblies in said given direction and permitting said relative movement therebetween.

4,133,254

CASE OPENER AND BOTTOM SEALER

Robert E. Odom, Blaine, and Gaylerd M. Lieder, Minneapolis, both of Minn., assignors to Bemis Company, Inc., Minneapolis, Minn.

Filed Jul. 27, 1976, Ser. No. 709,225
Int. Cl.² B31B *1/80*
U.S. Cl. 93—53 SD **46 Claims**



1. In a machine for erecting and folding a flat folded case blank having a pair of rectangular minor side walls joined at fold lines to opposed edges of a pair of rectangular major side walls, a longitudinally elongated frame having a rear end portion and a front end portion, support means for aidingly supporting a case blank after it is opened and supporting the opened case blank as the opened case blank is moved from a location remotely rearwardly of the frame front end portion to the frame front end portion, first means at the frame rear end portion for supporting a stack of said flat folded blanks in vertical stacked relationship with each blank having an upper major and a minor side wall above a lower major and a minor side wall, second means on the frame for gripping the upper major side wall of a blank on the top of the stack and moving the gripped case blank away from the stack to a position for the gripped blank in an opened condition being moved onto and along the means for supporting an opened case blank and thence release the gripped case blank, and third means for abutting against the upper minor side wall of the gripped blank to fold the upper minor side wall to extend at about right angles to the upper major side wall to open the gripped case blank and after the gripped case blank is released by the second means, move the opened case blank along the means for supporting a case blank in an opened condition, and fourth means for mounting the abutting means on the frame and moving the abutting means from the frame rear end portion toward the

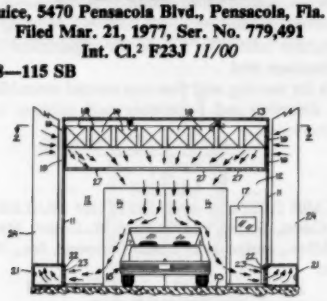
frame front end portion to move the opened case toward the frame front end portion.

4,133,255

PAINT SPRAY BOOTH AND METHOD OF PAINTING AN ARTICLE THEREIN

John J. Guice, 5470 Pensacola Blvd., Pensacola, Fla. 32505

Filed Mar. 21, 1977, Ser. No. 779,491
Int. Cl.² F23J *11/00*
U.S. Cl. 98—115 SB **1 Claim**



1. In a closed paint spray booth for painting an object therein and having a floor and upstanding walls, the improvement comprising:

(a) air inlet means around the entire upper perimeter of said side walls of said spray booth for introducing a uniform flow of filtered air into said spray booth,

(b) air exhaust means along the lower portion of said walls adjacent said floor for withdrawing paint laden air from said spray booth near said floor, and

(c) a continuous, horizontal baffle member subjacent said air inlet means extending inwardly of and around said spray booth and terminating inwardly thereof at a distance to define a single centrally disposed open space inwardly of said baffle member with said baffle member directing all of the air passing through said air inlet means inwardly of said baffle member and away from said upstanding walls of said spray booth in position to be first drawn downwardly by said air exhaust means onto and around said object being painted in a generally vertical direction and then be in position to be drawn by said air exhaust means outwardly in a uniform manner away from said object being painted and superjacent said floor to said air exhaust means.

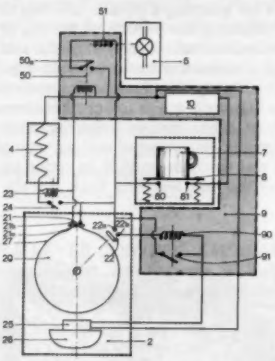
4,133,256

APPARATUS FOR JOINTLY ACTUATING AN ALARM AND PREPARING A HOT DRINK OR THE LIKE

Danielle M. Lamour, 19, rue du Docteur Finlay, 75015 Paris, France

Filed Jan. 30, 1978, Ser. No. 873,687
Claims priority, application France, Feb. 2, 1977, 77 02708
Int. Cl.² A47J *31/52*
U.S. Cl. 99—280 **10 Claims**

1. An apparatus for jointly actuating an alarm and preparing a liquid such as a drink, comprising a stand, means for receiving a vessel, such as a cup, means responsive to the removal of said vessel from said receiving means, an alarm, means for actuating the alarm at the desired time, means for stopping the alarm combined with said reponsive means for stopping the alarm when said vessel is removed from said receiving means, a tank for receiving liquid, valve means for pouring the liquid from the tank, means for opening the valve means, an electric heating resistance within the tank for heating the liquid, an electric power supply circuit connected to the heating resistance, for heating the heating resistance, switching means inserted in said circuit for opening and closing said circuit, a pouring spout associated with the tank and located downstream of the valve means relative to the tank, means defining a cavity for receiving a product for mixing with said liquid and interposed between the valve means and the spout and time delay means combined with said switching means and said means for actuating the alarm and said means for opening the valve means for closing said switching means before actuation



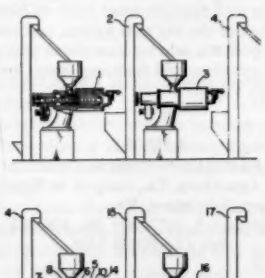
of the alarm and thereafter opening the valve means a short time before actuation of the alarm, the alarm being stopped by removal of said vessel.

4,133,257

RICE PEARLING APPARATUS WITH HUMIDIFIER

Toshihiko Satake, 2-38, Saijonishihonmachi, Higashihiroshima, Japan

Filed Feb. 17, 1977, Ser. No. 769,468
Claims priority, application Japan, Mar. 2, 1976, 51/22424
Int. Cl.² B02B *1/04, 3/00*
U.S. Cl. 99—518 **6 Claims**



1. An apparatus for pearling rice comprising:

a plurality of frictional rice pearling units, each unit including a perforated pearling cylinder;

means for feeding rice successively to each of the pearling units, the pearling units in series communication such that the output of one pearling unit is the input to an adjacent pearling unit; and

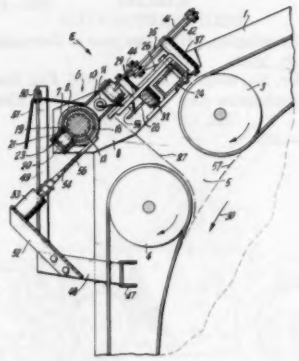
means for introducing a humidifying agent into a selected one of the plurality of pearling units at a location where a first quotient of the total surface area of the pearling cylinder divided by the product of the pearling ratio multiplied by the flow rate of rice after the introduction of the humidifying agent is not less than a second quotient of the total surface area of the pearling cylinder divided by the product of the pearling ratio multiplied by the flow rate of rice before the introduction of the humidifying agent and the pearling ratio is defined as the ratio of the weight of rice lost on pearling to the original weight of the rice.

4,133,258

DEVICE FOR BINDING A ROLLED BALE OF WINDROWED AGRICULTURAL CROP MATERIAL

Franz M. Popiolek, and Jürgen Simonis, both of Wolfenbuttel, Germany, assignors to Gebruder Welger, Wolfenbuttel, Germany

Filed Oct. 7, 1977, Ser. No. 840,296
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1976, 2645762
Int. Cl.[2] B65B *13/02*
U.S. Cl. 100—5 17 Claims



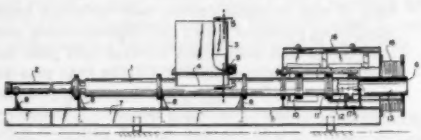
1. A device for helically winding twine about a bale of agricultural crop material rolled and compacted in a press having a gap through which the crop material is fed into the press comprising a movably mounted twine guide assembly for guiding the twine through the gap into the press, a cutter device operatively controlled by movement of said twine guide assembly for cutting the twine, and means supporting said twine guide assembly for movement in a rectilinear path parallel to the axis about which the bale is rolled.

4,133,259

REFUSE PELLETIZER

John F. Pelton, Yorktown Heights, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 690,281, May 26, 1976, Pat. No. 4,100,849, and Ser. No. 675,934, Apr. 12, 1976, abandoned.
This application Feb. 10, 1978, Ser. No. 876,697
Int. Cl.[2] B30B *15/26*
U.S. Cl. 100—43 10 Claims



1. Apparatus capable of producing pellets of compacted refuse having a density of at least 20 lbs./ft.[3] comprising:

(1) a cylindrical tube of uniform diameter comprising a ram housing section, a feed section, a compacting section, a compacted section and a restrictor section, said tube being provided in the feed section with a feed port in its side wall,

(2) a feed hopper for the refuse to be compacted having an outlet port communicating with the feed port of said tube,

(3) a reciprocating driven ram located in the ram housing section of said tube and axially aligned therewith, the perimeter of said ram being in sliding contact with the inner surface of said tube and capable of exerting a pressure of at least 200 psi on each forward stroke of the ram, and

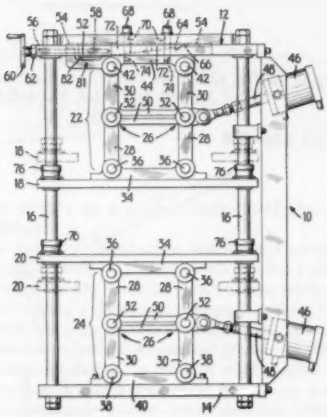
(4) means located in the restrictor section of said tube for variably restricting the flow of refuse in response to changes in the force required to advance the column of compacted refuse in the tube, comprising a plurality of axially elongated leaves located symmetrically around the circumference of said tube and being separated from each other by stationary portions which are an integral part of the tube, the side edge surfaces of each leaf being parallel to each other, each leaf constituting a flush section of the tube wall flexibly attached at its upstream end to the tube and provided at the downstream end with means for positively moving each of said leaves uniformly toward or away from the tube axis.

4,133,260

SHUT HEIGHT ADJUSTMENT MECHANISM

Peter H. Gundal, Centerville, Mass., assignor to Packaging Industries, Inc., Hyannis, Mass.

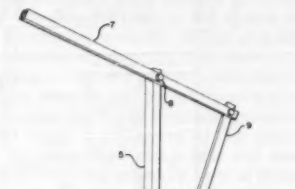
Filed Oct. 15, 1976, Ser. No. 732,666
Int. Cl.[2] B30B *1/16*
U.S. Cl. 100—257 3 Claims



1. In a press-type apparatus of the kind including first and second press members for supporting material engaging elements and wherein at least one of said press members is movable toward and away from the other member, an improved assembly including a base, said one press member being displaceable relative to said base when moving toward and away from said other member, a pair of toggle mechanisms coacting to displace said one press member toward and away from said base, each of said pair of said toggle mechanisms having a pair of links pivotally connected to each other near adjacent ends, the other end of one of said links of each pair being pivotable about a pivot on a bearing plate and the other end of the other link of each pair being pivotally connected to said one press member; and a shut height adjusting mechanism having means interposed between said base and said bearing plate for adjusting simultaneously and to the same extent the position with respect to said base of said bearing plate and each of said pivots thereon thereby adjusting the distance between said first and second press members and each of said pivots when said toggle mechanisms are operated to move said one press member toward said other press member, said adjusting mechanism including a wedge disposed in a recess formed in said base, each of a pair of opposite ends of said recess being engaged respectively by a corresponding one of a pair of projecting ends of said bearing plate, said wedge being located between said projecting ends of said bearing plate for movement in said recess between said pair of opposite ends thereof, whereby said

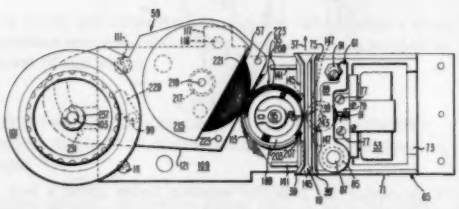
bearing plate is retained against movement in the direction in which said wedge moves, and slidably engaging a stationary bearing surface on said base and a bearing surface on said bearing plate, said wedge having an angular bearing surface slidably engaging one of the bearing surfaces on said base and plate, said one of the bearing surfaces being angled complementally with said angular bearing surface of said wedge, and means for moving said wedge between said base and said bearing plate along the bearing surfaces thereof to adjust the bearing plate position relative to said base, whereby slight adjustment of the position to which said toggle mechanisms move said one press member is effected, said moving means including a shaft extending through an opening provided in one of said projecting ends of said bearing plate, said shaft extending to said wedge and terminating in a threaded end received in a threaded bore in said wedge, a handwheel at the other end of said shaft for turning said shaft thereby to slide said wedge, at least one bolt extending through said base and a slot in said wedge into threaded engagement within a bore in said bearing plate to compress said bearing plate fast against said wedge, and indicator means associated with said wedge and one of the base and bearing plate for visably indicating the amount of movement of the bearing plate upon sliding of said wedge.

4,133,261
CAN CRUSHER
Larry M. Belfils, 12670 San Pablo Ave., Richmond, Calif. 94803
Filed Jun. 27, 1977, Ser. No. 810,526
Int. Cl.[2] B30B *1/04*
U.S. Cl. 100—280 **3 Claims**



1. A can crushing apparatus comprising:
(a) means for holding a can in a substantially upright position;
(b) means for applying compression pressure to said can longitudinally thereof further comprising:
(1) a base having a ridge attached thereto such that the upper portion of said ridge contacts the edge of said can and its longitudinal axis is oblique to the tangent of the perimeter of said can at the point of contact;
(2) an upright member attached to said base;
(3) a mounting member attached to said upright member;
(4) a press member slideably attached to said mounting member having means for allowing air to escape said can; and
(5) a handle having a first lever rotatably attached at one end to said mounting member and a second lever attached to said first lever at the end opposite the point of attachment to said mounting member and attached to said press member at a point remote from either end; and
(c) a means for crimping at least one side of said can along a substantially vertical first line, thence sequentially about the sides of said can, and terminating along a substantially vertical line second line opposite said first line; whereby a can held by said holding means may be compressed between said base and said press member to produce a circular package of concentrated mass with no cut edges.

4,133,262
INKING APPARATUS
Jack Beery, Farmington, Mich., assignor to Burroughs Corporation, Detroit, Mich.
Division of Ser. No. 650,707, Jan. 20, 1976, Pat. No. 4,069,755.
This application Aug. 15, 1977, Ser. No. 824,527
Int. Cl.[2] B41F *31/00*
U.S. Cl. 101—350 **4 Claims**



1. In a base-supported printing device for use in a document processor, wherein it is required that a coating of ink be applied to one or more rotatably operable print producing elements of the device for each printing cycle, improved ink applying means comprising:
(a) an inked roller rotatably mounted within a cutaway cartridge having a central aperture such that a predetermined arcuate portion thereof is exposed,
(b) means for mounting said cartridge in contiguous relationship with said print producing elements and such that said exposed arcuate portion of said inked roller is limitably disposed in juxtaposed relationship therewith, said mounting means including a cartridge supporting plate pivotally connected along a predetermined side edge thereof to said base of said printing device, said cartridge supporting plate being provided with a cartridge mounting post adjacent the pivotal connection between said plate and said base, a pair of spaced apart cartridge limit pins disposed along the end of said cartridge supporting plate interfacing with said print producing elements, a first arcuate slot disposed adjacent the end of said cartridge supporting plate remote from said interfacing end, a cammable pin disposed adjacent a predetermined end of said first arcuate slot, a second arcuate slot disposed intermediate said first arcuate slot and said cartridge mounting post, and a mounting post fixed to said cartridge supporting plate said post extending coaxially through said central aperture of said cartridge, and
(c) means for pivotally and retainably adjusting said mounting means relative to said base such that a predetermined minimal frictional contact is established between the exposed arcuate portion of said inked roller and said print producing elements, said frictional contact being effective to deposit a coating of ink on said print producing elements during the terminal phase of their operable rotation in each printing cycle.

4,133,263
SHEET-TURNING DRUM FOR PRINTING MACHINES CONVERTIBLE FROM PRINTING ON ONE SIDE OF A SHEET TO PRINTING ON BOTH SIDES OF A SHEET AND VICE VERSA

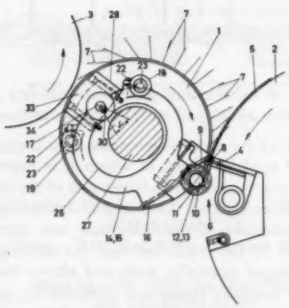
Paul Schilling, Neckargemund, Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany

Filed Oct. 21, 1976, Ser. No. 734,674

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1975, 2547251

Int. Cl.[2] B41F *21/04*

U.S. Cl. 101—409 2 Claims



1. Sheet-turning drum assembly for printing machines convertible from printing on one side of a sheet to printing on both sides of a sheet and from printing on both sides of a sheet to printing on one side of a sheet, comprising a drum, a shaft rotatably mounted on said drum, a tube surrounding said shaft and rotatable relative thereto, tongs-type grippers including a pair of tongs-type gripper halves each respectively mounted on said shaft and said tube for pivotal movement relative to one another, respective gears mounted on said shaft and said tube at opposite ends of said drum, separate toothed drive members respectively meshing with said gears for controllably pivoting each of said tongs-type gripper halves separately and independently of one another, pivot pin means disposed on said opposite ends of said drum for pivotally carrying said separate drive members, spring bearings mounted on said pivot pin means, means for mutually bracing said separate drive members resiliently against one another, said mutual bracing means comprising a prestressed torsion bar spring disposed between the drive members of the respective tongs-type gripper halves and having respective ends thereof secured in said spring bearings at said opposite ends of said drum, respective control cams mounted on said opposite ends of said drum, and respective follower rollers secured to said separate drive members and being in rolling engagement with the respective control cams under spring-loading by said prestressed torsion bar spring.

4,133,264
CLAMPING ASSEMBLY FOR THIN PRINTING PLATES

Rudy Fermi, South Bend, Ind.; John Pickard, San Antonio, Tex.; Alex Kocsis, Granger; David Bratton, Mishawaka, both of Ind., and Gerald Kasner, Union, Mich., assignors to K & F Manufacturing Co., Inc., Granger, Ind.

Continuation-in-part of Ser. No. 636,454, Dec. 1, 1975. This application Apr. 26, 1977, Ser. No. 790,937

Int. Cl.[2] B41F *27/06*

U.S. Cl. 101—415.1 21 Claims

1. A clamping assembly for releasably clamping a thin flexible printing plate in position against an outwardly facing plate supporting surface on a press cylinder; said clamping assembly comprising:

a clamp body having a plate edge clamping surface, and a pivot bar means having a pivot bar surface which is in facing relationship to said plate edge clamping surface, said pivot bar means being supported for pivotal movement between a first non-clamping position permitting insertion of a first edge portion of a printing plate between said pivot bar surface and said plate edge clamping surface and a second clamping position with said pivot bar surface clampingly forcing said first edge portion against said plate edge clamping surface and preventing withdrawal of said first edge portion,

wherein said clamp body is a rigid member having a first groove which opens in the radially outward direction when said clamp body is attached to a press cylinder, one side wall of said first groove constituting said plate edge clamping surface, and serving to engage the first edge of the plate wherein said rigid body further includes a second groove, said second groove serving to pivotally accommodate a corresponding portion of said pivot bar means, and

wherein said rigid member includes a third groove which extends linearly in a generally circumferential direction of said press cylinder when said clamp body is attached to the press cylinder, and wherein tension bar means having a radially extending groove for holding the second edge of the plate is slidably mounted in said third groove.

17. A clamping assembly for releasably clamping a thin flexible printing plate in position against an outwardly facing

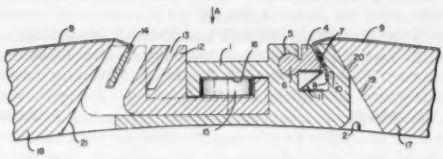


plate supporting surface on a press cylinder; said clamping assembly comprising:

a plurality of clamping members, a first of said clamping members being formed by a clamp body having a generally radially outwardly directed groove, one surface of said groove forming a plate edge clamping surface, and a second of said clamping members being formed by at least one pivot bar means located within said groove for clamping a first edge portion of a printing plate against said clamping surface, wherein said pivot bar means is supported by a socket-type pivotal interconnection between said clamp body and pivot bar means formed by a partially cylindrical portion of one of the first and second clamping members being rotatably retained within a partially cylindrical recess in the other of said clamping members for pivotal movement between a first non-clamping position, permitting insertion of said first edge between the clamping surface of the clamp body and a clamping portion of said pivot bar means which extends within said groove in facing relationship to said clamping surface, and a second clamping position, with said clamping portion forcing said first edge portion against said clamping surface preventing withdrawal of the first edge, and wherein spring means for biasing said pivot bar means toward said second position is provided within said groove.

4,133,265
TRAINING PROJECTILE

Walter Diesinger, and Axel Homburg, both of Bergisch Gladbach, Germany, assignors to Dynamit Nobel AG, Germany

Filed Dec. 10, 1976, Ser. No. 749,424

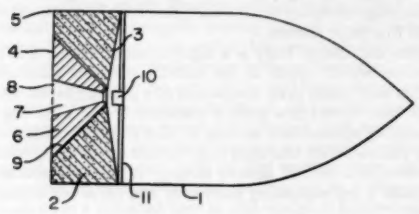
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1975, 2557293

Int. Cl.[2] F42B *13/20*

U.S. Cl. 102—92.7 25 Claims

1. A training projectile having a flight path of substantially shorter distance than a corresponding live projectile and comprising an auxiliary drive means for causing the training projectile to exhibit a ballistic trajectory corresponding to the

ballistic trajectory of a live projectile during the training flight phase of the training projectile travel, said auxiliary drive means serving for counteracting aerodynamic resistance to which the training projectile is exposed during the training



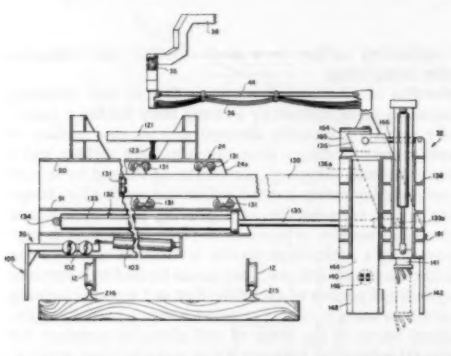
flight phase of projectile travel, the training projectile being provided with a mass so that the ratio of the resultant axial force to the mass of the training projectile is at least approximately equal to the ratio of the resistance force to the mass of a corresponding live projectile during the training flight phase.

4,133,266

RAILROAD CROSSTIE REPLACEMENT MACHINE

Glenn E. Taylor, 1345 Bankhead Ave., Atlanta, Ga. 30318

Filed Mar. 24, 1977, Ser. No. 780,716
Int. Cl.[2] E01B *29/10*
U.S. Cl. 104—9 **4 Claims**



4. In an apparatus for replacing crossties in railroad tracks including a vehicle moveable along the rails of the railroad track and a support housing carried by said vehicle, the improvement therein of a work head assembly attached to said support housing and comprising:

a pair of opposed jaw elements arranged for relative spreading and gripping movement in a plane approximately parallel to the rails of the railroad track, and hydraulic power means for actuating said jaw elements,

a push bar support outboard of said opposed jaw elements and movable in an approximately vertical plane independently of said jaw elements to limit the movement of a crosstie between the opposed jaw elements of said crosstie clamp assembly;

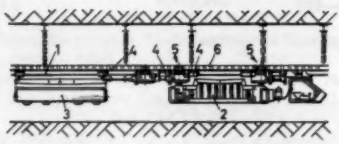
a shovel means mounted between said push bar and said pair of opposed jaw elements, said shovel means being vertically movable alternatively from a level higher than said jaw elements whereby said jaw elements can be operated without interference from said shovel means to a level lower than said clamp assembly whereby the shovel means reaches lower than the clamp means, and hydraulic power means for moving said shovel means in an approximately vertical plane.

4,133,267

TRAVEL DRIVE FOR A DRAWING ENGINE OF A ONE-RAIL TRACK SUSPENSION RAILROAD IN MINES

Laszlo Farkas, Am Hang 31, 4713 Bockum-Hövel, Fed. Rep. of Germany

Filed Jul. 19, 1977, Ser. No. 817,105
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1976, 2632506
Int. Cl.[2] B61C *11/00*
U.S. Cl. 105—29 R **4 Claims**



1. A travel drive for a drawing engine of a single rail suspended railroad used in mines, in which it is provided and located inside a gearing casing on either side of the track rail a friction drive and an indented drive, and where driving friction wheels are positooned horizontally and are compressible against the stem of the track rail and the driving toothed wheels are arranged coaxially with and above the friction wheels, may be limitedly raised and retracted by means of a lifting arrangement, are engageable only when projecting to their highest positions with, and capable of entering, the lateral indentations on the top side (headside) of the track rail,

characterized in that:

each one of the driving toothed wheels (**9**) is contiguous with a downwards extending long hollow axle (**10**) forming a double-action lifting cylinder, whereinto there is introduced a fixed piston rod (**11**) coupled at its lower terminal to the gearing casing, comprising in its lower region control ducts (**12**) and in its upper region a disc portion (**13**), while itself being torque transmittingly and shiftably located in a rotary drivable hollow shaft (**28**) being also of elongated configuration and extending downwardly, which shaft is formed in its lower region as a carrier of a driving gear (**29**) and at its top end as a bearing for the driving friction wheel, which driving friction wheel is provided at its top side with a circular protecting chamber (**33**) shaped to receive the driving toothed wheel (**9**) with its indented rim (**18**) in its rectracted position.

4,133,268

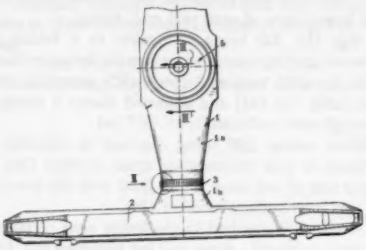
RAILWAY BOGIE-TRUCKS AND METHOD OF MANUFACTURING SAME

Jean C. Guillaumin, L'Etang la Ville, France, assignor to Societe des Acieries de Paris et d'Outreau, Paris, France

Filed Feb. 23, 1976, Ser. No. 660,131
Claims priority, application France, Feb. 25, 1975, 75 05816
Int. Cl.[2] B61F *5/04, 5/16, 5/26, 5/52*
U.S. Cl. 105—202 **4 Claims**

1. Rigid cast steel bogie truck for railway rolling stock, of the type comprising a single hollow cross beam and a pair of parallel longitudinal side members having each a hollow structure with a lateral inner wall and a lateral outer wall and two journal box cavities, said cross beam comprising a central section having two circular ends, and a pair of end sections, said central section includes a rigid bolster, each end section of said cross beam being rigid with said side members, and extending substantially inwardly towards said central section from, a central area of a corresponding longitudinal side member, each end section of said cross beam further having a sub-

stantially frustoconical configuration with a base and an apex, the base merging into the inner wall of the corresponding side



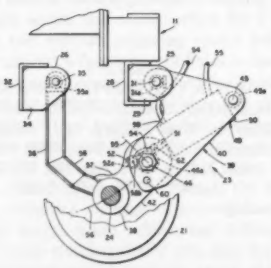
member, and the apex being butt-welded to a corresponding circular end of said central section of the cross beam.

4,133,269

RETRACTABLE RAILROAD WHEEL ASSEMBLY FOR ROAD VEHICLE

Glenn E. Taylor, P.O. Box 93006 Martech Sta., Atlanta, Ga. 30318

Filed May 23, 1977, Ser. No. 799,370
Int. Cl.² B62D *61/12*
U.S. Cl. 105—215 C **6 Claims**



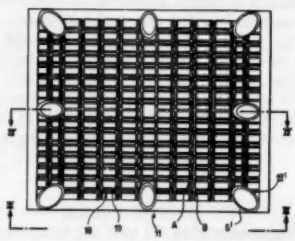
5. A retractable and distensible railroad wheel assembly for road vehicles comprising an axle, flanged steel wheels mounted at opposite ends of said axle, a pair of first and second support bearings for attachment to opposite sides of a vehicle with the second support bearings mounted along the normal direction of movement of the vehicle from the first support bearings, a retractable and distensible linkage assembly for each end of said axle for raising and lowering the railroad wheels, each linkage assembly comprising a wheel support arm pivotally connected at one of its ends to one of said first support bearings and connected at its other end to said axle, an actuating link means pivotally connected at a first pivot point to the second support bearing positioned in alignment with the first support bearing pivot point displaced from said first pivot point, an intermediate linkage means connected to said axle, a pivot pin extending through said actuating link means at said second pivot point and through said intermediate link means at a position displaced from said axle, a fluid actuated ram including a cylinder mounted on and movable with said actuating link means at a point in triangular relationship with respect to the first and second pivot points and a distensible and retractable ramrod connected to said intermediate link means at a point adjacent said pivot pin with the ramrod connection to said intermediate link means movable about said pivot pin between a position approximately level with the pivot pin when the wheels are distended and a position approximately above the pivot pin when the wheels are retracted.

4,133,270

PLATFORM FOR THE LIFTING AND HANDLING OF GOODS

Pasquale Ravera, Turin, Italy, assignor to Stars Stampaggio Resine Speciali S.p.A., Turin, Italy

Filed Jul. 5, 1977, Ser. No. 815,686
Claims priority, application Italy, Jul. 6, 1976, 68680 A/76
Int. Cl.² B65D *19/32*
U.S. Cl. 108—51.1 **6 Claims**



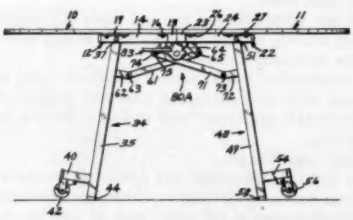
1. In a platform for the lifting and handling of goods, comprising a base frame, a frame forming a loading plane, both frames being made of a polymeric material, and being superimposed on one another, and uprights extending between and connecting the frames, the improvement wherein the frame forming the loading plane is formed by a pair of spaced apart superimposed reticular structures which each comprise a network of intersecting elongate members, the members of each reticular structure being staggered with respect to those in the other such structure and the reticular structures being connected at least by means of joining elements connecting the structures at locations where the elongate members of one structure cross those of the other structure forming the loading frame itself as a rigidly braced three dimensional reticular framework structure.

4,133,271

FOLDING TABLE WITH LOCKING HINGE

Casey L. Carlson, Minneapolis, Minn., assignor to Sico Incorporated, Minneapolis, Minn.

Filed Aug. 15, 1977, Ser. No. 824,704
Int. Cl.² A47B *3/00*
U.S. Cl. 108—113 **8 Claims**



1. An improved lockable hinge for a folding table which includes a pair of table surface members, legs pivotally attached to the table surface members and hinge means connecting the table surface members along adjacent edges thereof for permitting folding of the table between a storage position in which the table surface members are generally vertically oriented, and a usable position in which the table surface members are generally horizontally positioned adjacent each other to define a table surface, with the hinge means comprising at least a pair of hinge plates attached respectively to the table surface members beneath their adjacent edges, means pivotally connecting said hinge plates, and a lock bar for selectively engaging the hinge plates to lock the table in intermediate and usable

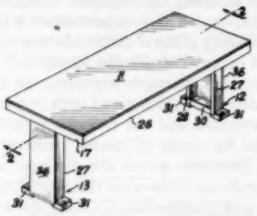
positions, wherein the improvement comprises means for suspending said lock bar beneath one of said table surface members with the lock bar positioned so that the hinge plate is between the lock bar and the adjacent edge of the table surface member and said lock bar is spaced from said adjacent edge and for permitting movement of said bar toward said hinge plate as the table is moved from its storage position, the hinge plate on said one table surface member having a recess formed in its edge for receiving said locking bar, the hinge plate on the other of said table surface members having a tab with a first edge positioned to engage said lock bar when the table reaches said intermediate position short of said usable position and a second edge positioned for engaging the lock bar when the table is in its usable position, said lock bar being spaced from said adjacent edge in all said table positions, and a handle attached to said lock bar extending away from said adjacent edges, whereby said handle can be actuated to remove the lock bar from the hinge plate recess to release the lock.

4,133,272

PICNIC TABLE

Michael Naglowsky, 2716 W. 16th St., Erie, Pa. 16505

Continuation of Ser. No. 658,287, Feb. 17, 1976, abandoned.
This application May 2, 1977, Ser. No. 793,130
Int. Cl.[2] A47B *3/00*
U.S. Cl. 108—132 **1 Claim**



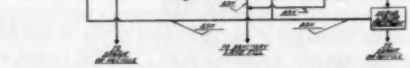
1. A table comprising,
a table top made of a generally flat, rectangular plate-like member (11) forming a table top,
two spaced end skirts (17),
each end skirt (17) being fixed to the underside of the plate-like member (11) adjacent the ends thereof and extending downwardly therefrom,
spaced side skirts (26),
each said side skirt (26) being fixed to the underside of said plate-like member (11) and attached to said end skirts (17) at their ends,
said side skirts (26) and said end skirts (17) together extending entirely around the periphery of said table top below the underside thereof,
an intermediate cross member (24) fixed to the underside of said table and extending generally parallel to said end skirts (17) and being fixed to said side skirts at their midpoints,
spaced legs (12, 13),
said legs (12, 13) comprising space leg members (12, 13),
a cross member (29) fixed to said leg members and extending therebetween at the upper ends of said leg members (12, 13),
a lower spacer (30) fixed to the lower ends of said leg members and extending transversely thereof,
a sheet of material (36) overlying each said leg members (12, 13), and said lower spacer (30) fixed thereto,
said sheets (36) terminating at their upper end at the lower edge of said cross member (29) and said end skirts (17) resting on the upper edge of said sheets,
piano hinges (15),
each said piano hinge (15) being fixed to the underside of said table top (11) at a position spaced inwardly from said end skirts (17),
bolts,
said bolts (32) extending through each said end skirt (17) and through said cross members (29) whereby said end skirts and said cross members are held rigidly together and said legs are held in vertical rigid position perpendicular to said table top with the upper edge of said sheet resting on the lower edge of each said end skirts,
said legs (12, 13) being swingable to a folded position wherein said leg members rest on the lower surface of said table top (11) with said sheets (36) generally parallel to said table top (11) and disposed above a plane passing through said end skirts,
the lower spacer (30) being disposed in adjacent parallel relation to said intermediate cross member (24) and the outer side of said sheet (36) is flush with the lower surface of said intermediate member (24),
foot means (31) attached to the lower ends of said legs extending outwardly from said leg members (12, 13),
said foot means each having a surface flush with the outer surface of said sheets and a lever (25) pivoted to said cross member (24) and swingable to underlie said foot means for locking said legs in folded position.

4,133,273

SYSTEM FOR THE DISPOSAL OF SLUDGE, HAZARDOUS AND OTHER WASTES

Thomas J. Glennon, West Milford, N.J., assignor to International Mechanical Contractors, Inc., West Milford, N.J.

Filed Jan. 26, 1978, Ser. No. 872,575
Int. Cl.[2] F23G *5/02, 7/00*
U.S. Cl. 110—346 **11 Claims**



1. An ecologically clean process for the disposal of sludge from the treatment of waste water together with admixed hazardous waste material, which comprises:
a. dewatering said sludge to form a partially dewatered sludge containing at least about 25% solids, the remainder being water;
b. blending said partially dewatered sludge with hazardous waste material to provide a substantially homogeneous waste mixture which when brought to the ignition temperature thereof in the presence of sufficient air is at least nearly autogeneously combustible; and
c. incinerating said at least nearly autogeneously combustible mixture at a temperature of at least about 1400° F. for sufficient time to substantially completely combust said mixture to substantially odor-free off gases.

4,133,274

METHOD OF REGENERATING LAWN SURFACES

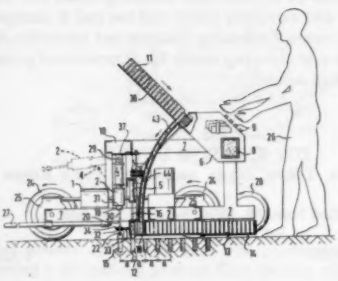
Günther Orth, Birken; Rudolf Pietsch, Betzdorf, Sieg, and Ewald Grundler, Steinach üb., all of Fed. Rep. of Germany, assignors to Wolf-Gerate GmbH, Betzdorf, Sieg, Fed. Rep. of Germany

Filed Feb. 28, 1977, Ser. No. 773,125

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1976, 2608074

Int. Cl.[2] A01C *11/00*

U.S. Cl. 111—2 3 Claims



1. A method for regenerating lawn surfaces comprising the steps of providing a plurality of tubular turf plugs of cylindrical configuration on a wheeled vehicle capable of movement across the lawn surface to be regenerated, causing said vehicle to move forward across said lawn surface for a desired distance, stopping said vehicle, actuating rotary drill means on said vehicle for drilling a first group of holes in the lawn while said vehicle is stopped, causing said vehicle to move forward said desired distance, stopping said vehicle and actuating said rotary drill means on said vehicle to drill a second group of holes in said lawn surface while simultaneously actuating plug inserting means for inserting tubular turf plugs in said first group of holes and completing treatment of the lawn surface by successively repeating the steps of moving the vehicle said desired distance, stopping the vehicle and drilling additional groups of holes while simultaneously actuating the plug inserting means for inserting turf plugs in the group of holes drilled in during the next preceeding drilling operation.

4,133,275

AUTOMATIC SEWING MACHINE

William P. Herzer, Northboro, and Robert E. Cullen, Norwood, both of Mass., assignors to Union Special Corporation, Chicago, Ill.

Division of Ser. No. 592,951, Jul. 3, 1975, Pat. No. 4,051,794, which is a continuation-in-part of Ser. No. 496,748, Aug. 12, 1974, Pat. No. 3,982,491. This application May 12, 1977, Ser. No. 796,081

Int. Cl.[2] D05B *21/00*

U.S. Cl. 112—121.12 60 Claims

9. An automatic sewing machine, comprising:

a sewing needle;

a work holder for retaining a work piece during sewing;

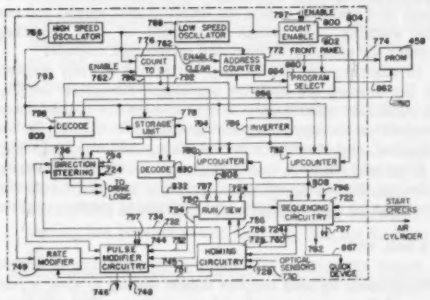
means for determining the location of the work holder relative a reference position;

a stepping motor for moving the work holder relative a reference position;

means for controlling direction of the stepping motor for moving the work holder toward said reference position;

means for generating a pulse train for energizing the stepping motor; and

means responsive to the determining means for inhibiting the generating means and stopping the stepping motor subsequent to movement of the work holder past said reference position and generation of a plurality of pulses by the



generating means to move the work holder to a predetermined position spaced from the reference position.

4,133,276

STOCKING TOE END CLOSING APPARATUS

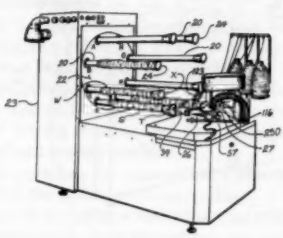
Fabio Selvi, Florence, Italy, assignor to Speizman Industries, Inc., Charlotte, N.C.

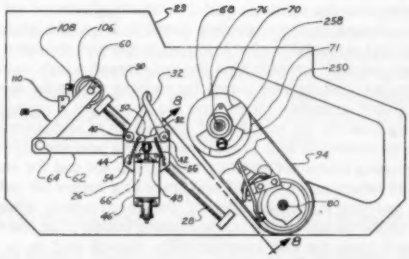
Filed Feb. 17, 1977, Ser. No. 769,654

Claims priority, application Italy, Feb. 20, 1976, 9356 A/76; Jun. 28, 1976, 9498 A/76

Int. Cl.[2] D05B *21/00*

U.S. Cl. 112—121.15 26 Claims





1. In a stocking toe end closing apparatus having seaming means for closing toe ends of stockings and elongated stocking support means for supporting stockings with an open toe end at a spreading position, the improvement comprising:

(a) movable expandable spreading means insertable while contracted into said support means and the open toe end of a stocking carried on the support means at the spreading position from the exterior of the toe end thereof and expandable after insertion to support the open toe end and spread it laterally to a flat widespread width suitable for seaming; and

(b) transfer means for causing sequential movement of said spreading means into the toe end of a supported stocking from the toe end thereof, movement of said spreading means in relation to said support means to a position adjacent said seaming means for locating said spread toe end for seaming, and return movement of said spreading means for subsequent insertion movement thereof.

22. In stocking toe end closing apparatus having seaming means for closing toe ends of stockings, elongated support means indexable transversely to said elongation to and away from a position for supporting said stockings for closing the toe ends thereof, and means for withdrawing said stockings partially from said support means in preparation for and during said closing; the improvement comprising means for restraining stockings on said supports, said restraining means comprising:

(a) a belt, and

(b) means supporting said belt for free-running deflected engagement by said support means during at least a portion of the movement of said support means to and away from said closing position and while at said closing position.

4,133,277

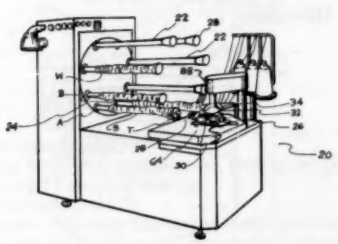
STOCKING TOE END CLOSING APPARATUS

Ronald L. Arthur, and Buddie A. Rankin, both of Charlotte, N.C., assignors to Speizman Industries, Inc., Charlotte, N.C.

Filed Aug. 22, 1977, Ser. No. 826,746

Int. Cl.[2] D05B *21/00*

U.S. Cl. 112—121.15 18 Claims



1. In a stocking toe end closing apparatus having seaming means for closing toe ends of stockings; elongated stocking support means for supporting stockings with an open toe end at a spreading position; movable expandable spreading means insertable into the open toe end of a stocking carried on the support means at the spreading position from the toe end thereof and expandable after insertion to support the open toe end and spread it laterally to a flat widespread width suitable for seaming; and transfer means for causing sequential movement of said spreading means into the toe end of a supported stocking from the toe end thereof, movement of said spreading means in relation to said support means to a position adjacent said seaming means for locating said spread toe end for seaming, and return movement of said spreading means for subsequent insertion movement thereof; the improvement wherein said transfer means causes said spreading means to be inserted into said open toe end longitudinally thereof and to be removed longitudinally therefrom after said locating said spread toe end for seaming and essentially before said return movement of said spreading means.

16. In a stocking toe end closing apparatus having seaming means for closing toe ends of stockings; clamping means located for clamping a stocking toe end and moving it past said seaming means for closing; elongated stocking support means for supporting a stocking with an open toe end at a spreading position; movable expandable spreading means insertable into the open toe end of a stocking carried on the support means at the spreading position and expandable after insertion to support the open toe end and spread it laterally to a flat widespread width suitable for seaming; transfer means for causing sequential insertion movement of said spreading means into the toe end of a supported stocking, movement of said spreading means in relation to said clamping means to a position for locating the supported widespread toe end in said clamping means for clamping thereby with its extremity outside thereof, and return movement of said spreading means for subsequent insertion movement thereof; and means for expanding said sreading means after said insertion movement thereof within a stocking toe end and for contracting said spreading means to release the toe end of the stocking after it is clamped by said clamping means; the improvement comprising a perforated suction plate located adjacent said clamping means and underneath said toe end extremity when said toe end is clamped in said clamping means for holding said toe end extremity down and away from said clamping means for direction and guidance into said seaming means.

4,133,278

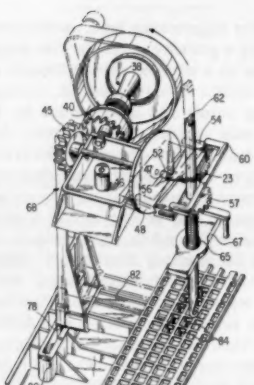
TOY KNITTING DEVICE

Osamu Kimura, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Japan

Filed Nov. 18, 1976, Ser. No. 743,036

Int. Cl.[2] D05C *15/14*

U.S. Cl. 112—198 8 Claims



1. An amusement device for attaching yarn to a frame, comprising a housing provided with a platform, a handle, means mounting said handle to said housing for rotation, an advancing mechanism provided with means for gripping the frame, means operatively connecting said handle and said advancing mechanism for moving said gripping means in and out of engagement with the frame to advance same along said platform, a needle provided with means for gripping the yarn, and means operatively connecting said handle and said needle for rotating and reciprocating said needle in a predetermined sequence so as to progressively attach the yarn to the frame.

4,133,279

SEWING APPARATUS

Siegfried Wajcmann, c/o 5434 St. Dominique St., Montreal, Quebec, Canada

Filed Feb. 24, 1977, Ser. No. 771,764

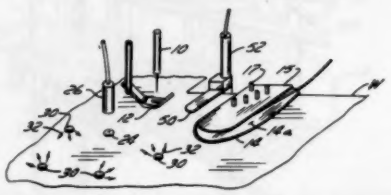
Claims priority, application United Kingdom, Mar. 16, 1976, 10370/76

Int. Cl.[2] D05B *35/10, 27/10, 65/06*

U.S. Cl. 112—153 5 Claims

1. In a sewing apparatus for sewing two or more layers of similar or dissimilar material together, wherein the sewing is

carried out by a sewing machine relative to a fixed generally planar surface, the improvement comprising a generally planar material positioning device mounted in parallel relationship to said fixed surface and in a spaced apart relationship thereto, said positioning device having a pair of opposed major faces whereby there is formed a passageway between one of said major faces and said fixed surface with a first layer of the material to be sewn being adapted to pass therebetween and a second layer of said material to be sewn being adapted to pass between the other of said major faces of said positioning device and a further planar member parallel to said other major face,



conduit means associated with said positioning device for delivering a pressurized gaseous flow thereto, said positioning device having a first outlet associated therewith for displacing a pressurized gaseous flow in a generally parallel direction along one of said major surfaces, and a second outlet for dispensing a second pressurized gaseous flow along the other of said major surfaces in a generally parallel direction whereby said gaseous flow along said major surfaces is adapted to position layers of material in an abutting relationship with guiding means, and pneumatically operated means for retarding the rate of feeding of at least one of the layers of material.

4,133,280

AUTOMATIC METHOD AND APPARATUS FOR CLOSING A TOE END OF A HOSE UTILIZING A STRAIGHT LINE STITCH

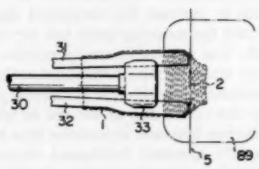
Osho Takatori, Nara; Etsuo Nishikawa, Goze, and Yosinobu Fukuyama, Kashihara, all of Japan, assignors to Takatori Machinery Works, Ltd., Yamatotakada, Japan

Filed Feb. 10, 1977, Ser. No. 767,486

Claims priority, application Japan, Oct. 26, 1976, 51-127773; Oct. 26, 1976, 51-127774

Int. Cl.[2] D05B *21/00, 97/00*

U.S. Cl. 112—262 **20 Claims**



1. A method of automatically closing each toe of a plurality of hose materials successively by a straight line stitching wherein said materials are held on a plurality of pairs of parallel and horizontal holding member units together with suction tubes including support members and finger pieces continuously travelling in a lateral direction and wherein a sewing machine is disposed stationarily at one portion within said lateral travelling passage, so that the toe-closing operation is accomplished while said holding member units, said support members and said suction tubes are continuously travelling in a lateral direction, the method characterized by the steps of:

arranging an end of said hose material turned inside-out at a position outside the outer end of said holding member and finger pieces, wherein said hose material covers said holding member and said finger pieces;

laterally spreading said hose material by a pair of said finger pieces extending from within said support members which are inserted within said material, so as to deform said hose material into a concaved configuration at the edge of the toe end portion of said hose material;

bringing said hose material together with said finger pieces to a stitching line of said sewing machine while said hose material is maintaining its laterally-spread condition;

stitching the thus deformed toe part along a straight line perpendicular to the center line of said material so as to form said straight line stitching on said toe part to be closed, and at the same time cutting said toe part along a cutting line parallel to said stitching line, for forming a cut edge;

restoring said deformed toe part to its original undeformed state, and;

freeing the toe-closed hose material from the holding action of said pair of finger pieces caused by retracting said finger pieces into said support member.

3. An apparatus for closing a toe portion of a hose material, comprising:

a sewing machine disposed stationarily;

a plurality of holding member units and suction tubes which travel laterally to the front of said sewing machine, each of said holding member units and said suction tubes holding one hose material to be toe-closed;

a pair of finger pieces mounted on each of said holding member units, spreading means for said finger pieces, whereby the free ends of said finger pieces can be spread out laterally, and;

a laterally moving device for moving said holding member units together with said finger pieces and said suction tubes in a lateral direction with respect to said sewing machine when the front edges of said finger pieces together with said hose material enter into the stitching line of said sewing machine and pass through the stitching zone of said sewing machine.

18. In an apparatus for automatically closing the toe of a hose material, the combination comprising

a holding unit including a hollow suction tube for receiving a toe portion of a hose thereover;

a winding-on means for winding-on a hose material on said tube from within said tube; and

a photocell-type detecting device disposed outside said tube for controlling said winding-on means, said detecting device being disposed to direct a light beam into the interior of said tube to detect the presence of the hose material therein whereby upon movement of the end of said hose material in said tube past said light beam, said detecting device emits a signal indicating the occurrence of such a condition to stop said winding-on means.

4,133,281

VACUUM CHARGING OF CONTAINERS FROM BULK SUPPLY

Gordon Holmes, Tenbury Wells, and Geoffrey R. Martin, Bromyard, both of England, assignors to Albro Fillers and Engineering Company Ltd., Bromyard, England

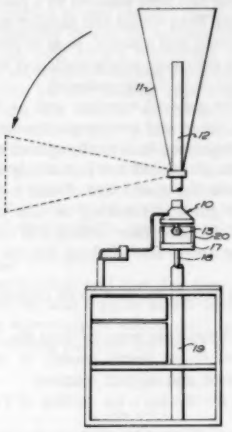
Filed Jul. 20, 1977, Ser. No. 817,438

Int. Cl.[2] B65B *3/04*

U.S. Cl. 141—1 **11 Claims**

1. A method of charging a container with a predetermined quantity of a fluent material including the steps of connecting the container to a bulk supply of the material, applying a vacuum within the container at a predetermined pressure level and for a predetermined period of time to draw a charge of material into the container, the quantity of said charge being determined as a function of said pressure level and said period, and

vacuum purging surplus material from the connection between the container and the bulk supply on completion of a filling



operation and before commencement of a succeeding filling operation.

4,133,282

CUSHION SEALS FOR AIR CUSHION VEHICLES

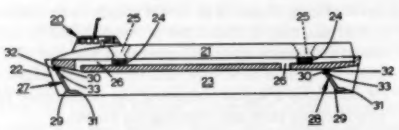
Christopher Cockerell, Southampton, England, assignor to British Hovercraft Corporation Limited, Yeovil, England

Filed Sep. 20, 1977, Ser. No. 834,968

Claims priority, application United Kingdom, Sep. 27, 1976. 40053/76

Int. Cl.[2] B60V *1/04*

U.S. Cl. 114—67 A **30 Claims**



1. A cushion containing seal for an air cushion vehicle comprising,

a plurality of elongated stiff members,

means for attaching each said stiff member adjacent one end thereof to rigid structure of the air cushion vehicle,

sealing means cooperating with adjacent elongated stiff members for sealing the interspace between members against the escape of cushion air therethrough, said sealing means extending substantially from one end of said members to the other end thereof,

said sealing means disposed between each pair of elongated stiff members comprising at least one flexible impermeable member whereby each said elongated stiff member may deflect with respect to the next adjacent stiff member by movement about said attaching means to the vehicle rigid structure.

4,133,283

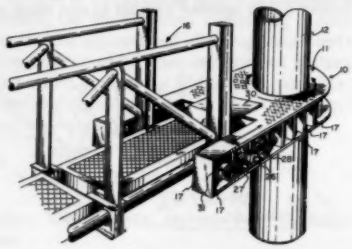
DIRECTIONAL FORCE SYSTEM FOR DIRECTIONALLY COUNTERING HORIZONTAL MOORING FORCES

William J. Ryan, Lorenauville, La., assignor to Ryan Ramp, Inc., New Orleans, La.

Continuation-in-part of Ser. No. 501,991, Aug. 30, 1974, Pat. No. 4,003,473. This application Jan. 7, 1977, Ser. No. 757,755

Int. Cl.[2] B63B *21/00*

U.S. Cl. 114—230 **14 Claims**



1. A system for minimizing or countering horizontally acting mooring forces tending to move a vessel away from a mooring structure while the vessel is moored to a mooring point on the mooring structure in an area subject to relatively high seas or waves comprising:

(a) a frame attachable to the mooring point;

(b) extendible, at least generally rigid attachment means relatively movable and pivotably attachable to said frame about a horizontal pivot axis for attaching and mooring the marine vessel to said frame, said attachment means allowing the moored vessel to move up and down a relatively large distance responsive to the crests and troughs of waves and lengthening and shortening as the vessel moves up and down, said extendible rigid attachment means being the only connection under tension between the vessel and the mooring structure

(c) movement limit means associated with said attachment means for limiting the amount of extendability of said attachment means between the moored vessel and the mooring point; and

(d) directional force means associated with said attachment means for relatively resisting relative movement between said frame and said attachment means in the horizontal direction to minimize the horizontally acting mooring forces, said directional force means substantially resisting relative movement in the direction of the movement which tends to increase the horizontal distance between the vessel and the mooring point but providing some but substantially less net resistance to relative movement in the opposite direction; the differential action of said force means diminishing the adverse horizontal mooring forces created by the vessel due to the sea or wave conditions and maintaining between successive seas or waves an at least generally constant horizontal separation distance between the attachment means and the mooring point within the limits of said movement limit means.

4,133,284

COOLING SYSTEM FOR MARINE ENGINES

William L. Holcroft, Anaheim, Calif., assignor to George Hashimoto, Gardena, Calif.

Filed Jun. 15, 1977, Ser. No. 806,712

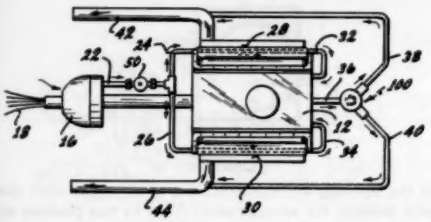
Int. Cl.[2] B63H *11/02*

U.S. Cl. 115—75 **8 Claims**

1. A cooling system for marine engines for use in hydraulically propelling a boat and wherein the hydraulic propulsion system provides a flow of water to the engine for cooling and wherein the water is provided at a range of pressures including a high pressure substantially in excess of twenty-five pounds

per square inch and wherein the flow of water from the engine is provided to the exhaust gases for cooling the exhaust gases, the cooling system, including,

a pressure regulator for receiving the complete flow of cooling water from the hydraulic propulsion system and for providing this complete flow of water to the engine for cooling and with the pressure regulator providing the complete flow of water to the engine at a pressure substantially less than the high pressure from the propulsion system,



a thermostat located to receive water from the engine and for regulating the complete flow of water from the engine to the exhaust gases in accordance with the temperature of the water from the engine, and

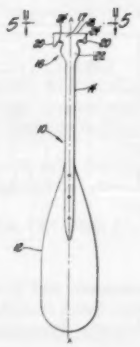
the thermostat providing a minimum complete flow of water from the engine to the exhaust gases even when the water is at its coldest temperature.

4,133,285

BOAT PADDLE

Wayne R. Phillips, 2260 Germantown Sq. West, Germantown, Tenn. 38138

Filed Jul. 18, 1977, Ser. No. 816,890
Int. Cl.² B63H *16/04*
U.S. Cl. 115—24.1 **6 Claims**



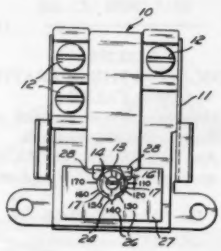
1. A paddle for manually propelling a watercraft such as a canoe, said paddle comprising a blade, a handle and an intermediate portion connecting said blade and said handle, said blade, handle and intermediate portion having substantially a common axis, said handle comprising an unencumbered edge transverse to said axis to be grasped by the canoeist's fingers and a contoured edge providing a saddle against which the base of the canoeist's thumb can exert pressure when the handle is gripped, said saddle being spaced from said axis such that substantially all of the fingers can grasp said edge, said handle being generally T-shaped and comprising a cross member at the end of said intermediate portion normal to said axis, said cross member having discreet projections at the ends thereof extending toward said blade and generally parallel to said axis, said intermediate portion having a wider flattened portion at said handle adapted and positioned so as to be engaged by the canoeist's lower palm when his fingers grip said transverse edge.

4,133,286

ADJUSTABLE THERMOSTAT

Jonathan L. Linton, Mansfield, Ohio, assignor to Therm-O-Disc Incorporated, Mansfield, Ohio

Filed Feb. 24, 1977, Ser. No. 771,528
Int. Cl.² G01D *13/22*; G05D *23/00*
U.S. Cl. 116—313 **11 Claims**



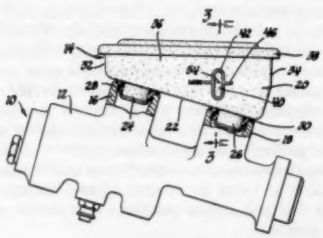
1. A thermostat comprising a substantially rigid body, an adjusting stem journaled on said body for rotation about an axis to adjust the operating temperature of said thermostat, said body providing a fixed surface spaced from said axis, an indicator mounted on said stem for rotation therewith and providing a generally cylindrical radially extending portion formed of deformable material, said deformable material providing a deformable surface engaging said fixed surface and being deformed from its unstressed condition by such engagement, said engagement between said fixed surface and said deformable surface providing friction resisting rotation of said indicator and in turn said stem with respect to said body.

4,133,287

RESERVOIR WITH INTEGRALLY FORMED WINDOW AND METHOD OF MAKING SAME

Thomas C. Downs, Tipp City, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 13, 1978, Ser. No. 877,017
Int. Cl.² G01D *11/26*; G01F *23/02*
U.S. Cl. 116—227 **5 Claims**



1. A liquid reservoir having an integrally formed window for visually determining the level of liquid adapted to be contained therein, said reservoir comprising:

a one-piece reservoir housing molded from a mixture of plastic and discrete particles, said housing having side and bottom walls of sufficient thickness and density to contain liquid in an automobile engine compartment environment and characterized by having such a low level of light transmittal as a result of such thickness and density of discrete particles that the level of liquid contained therein

may not be normally determined visually by observation through a side wall;

at least one side wall having a window integrally molded therein from the mixture of plastic and discrete particles during the molding of said reservoir housing;

said window being sufficiently thin and so molded that the concentration of discrete particles in the window is substantially less than the concentration of discrete particles in the other parts of the housing, providing a sufficiently high level of light transmittal through said window to permit the level of liquid contained in said reservoir housing to be visually determined by observation through said window.

4,133,288

DEVICE FOR INDICATING THE OPERATIVE POSITION OF A VALVE

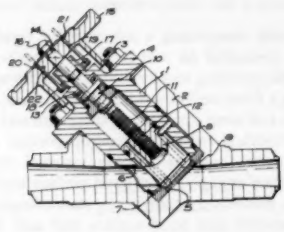
Colin H. Burgess, Holcombe Brook, England, assignor to Dynamic Controls Limited, Oldham, England

Filed Apr. 1, 1977, Ser. No. 783,762

Claims priority, application United Kingdom, Apr. 5, 1976, 13648/76

Int. Cl.² F16K *37/00*

U.S. Cl. 116—277 **25 Claims**



1. A rotary actuator comprising:

a housing having a bore therein;

a spindle having first and second ends and extending through and being rotatable in the bore of said housing;

means securing said spindle against axial movement within the bore;

a rotatable actuating member located wholly outside said housing and coupled to said first end of said spindle whereby rotation of said actuating member causes rotation of said spindle;

at least one indicator for indicating the position of means to be connected to the second end of said spindle and to be controlled by said actuating member, said indicator being located wholly outside said housing and out of axial alignment with said spindle, said indicator being rotatable with said actuating member and being movable upon rotation of said actuating member relative to a given surface of said actuating member between first position substantially flush with or recessed into said surface and a second position projecting from said surface; and

coupling means between an outer surface of said housing and said indicator to cause movement of said indicator between said first and second positions on rotation of said actuating member.

4,133,289

DEVICE FOR RECORDING CHANGES IN INDICIA

Robert W. Beattie, 9 Kipling Pl., Frankston, Victoria, Australia (3199)

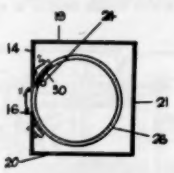
Filed Jan. 5, 1978, Ser. No. 866,997

Claims priority, application Australia, Jan. 7, 1977, 8694/77

Int. Cl.² G09F *9/40*

U.S. Cl. 116—309 **7 Claims**

1. A device for recording successive changes in indicia including a support structure, a front wall portion supported by the support structure, a display opening in the front wall portion,, a fulcrum horizontally disposed above the opening on the rear side of the wall portion, an annular member on the rear side of the wall portion and through which the fulcrum extends eccentrically such that the annulus, when resting under its own weight on the fulcrum, presents a portion of its circumference



against the opening and constructed and arranged such that manually pushing the annulus away from its rest position results in pivoting about the fulcrum and thereafter, in returning to its rest position under its own weight, moves circumferentially with respect to the fulcrum to present an adjacent circumferential portion to the opening.

4,133,290

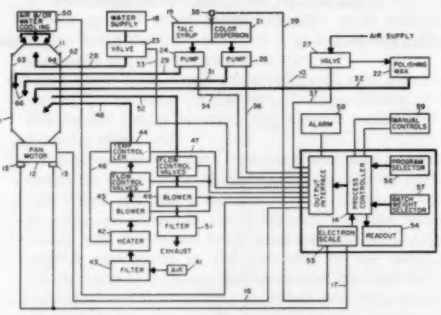
TABLET COATING APPARATUS WITH WEIGHT MONITORING

Guido W. Melliger, Dover Garden Motel, Apt. 44, S. Salem St., Victory Garden, Dover, N.J. 07801, assignor to Guido W. Melliger, Dover, N.J.

Continuation-in-part of Ser. No. 672,766, Apr. 1, 1976, abandoned. This application Mar. 14, 1977, Ser. No. 777,468

Int. Cl.² B05C *3/08, 11/02*

U.S. Cl. 118—7 **11 Claims**



1. An apparatus for automatic and continuous coating of solid pharmaceutical dosage forms comprising,

a container means in rotatable communication with a rotating means,

the container means and the rotating means in operative relation to a weighing means for continuously determining the weight of the dosage forms and coating material in the container means,

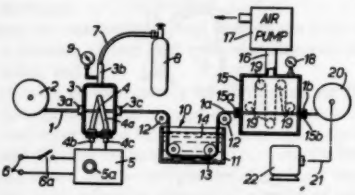
one or more material reservoirs having conduit means in fluid communication with the interior of the container means, the reservoir also having flow control means to control the flow of material from the reservoir through the conduit means to the interior of the container means,

a process controller means in independent electronic communication with each of the rotating means, the weighing means, and the flow control means, for controlling the rotating of the container means and the flow of material from the reservoir in preprogrammed sequence based upon the changing weight of the tablets and tablet coating in the container means.

4,133,291
APPARATUS FOR FLUX COATING METAL WICK

Ernst Spirig, Mövenstrasse 37, CH8640 Rapperswil, Switzerland

Division of Ser. No. 681,843, Apr. 30, 1976, Pat. No. 4,081,575. This application Dec. 22, 1977, Ser. No. 863,358
Int. Cl.[2] B05C *3/12*
U.S. Cl. 118—50 2 Claims

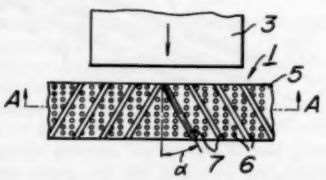


1. Apparatus for coating a metal wick with an adherent coating of a fluxing material, comprising
(a) means (3) defining an enclosed chamber;
(b) means (8) for maintaining a reducing atmosphere in said chamber;
(c) means (2, 20) for progressively passing the wick through the chamber;
(d) means (4) within the chamber for heating the wick to deoxidize the same;
(e) means (10) for wetting the deoxidized wick with a solution of the fluxing material in a volatile solvent; and
(f) means for evaporating the solvent from the wick to leave an adherent coating of the fluxing material on the wick, said evaporating means including means (15) defining an enclosure through which the wetted wick is transported, and means (17) for evacuating the enclosure to a subatmospheric pressure at room temperature, whereby the solvent will evaporate at room temperature at a speed that does not impair the continuity of the flux coating.

4,133,292
WET-DEVELOPING STATIONARY ELECTRODE

Noboru Takasugi, Higashi Yamato, and Yoshiro Suzuki, Hachioji, both of Japan, assignors to Olympus Optical Company, Ltd., Tokyo, Japan

Filed Jul. 8, 1977, Ser. No. 814,116
Claims priority, application Japan, Aug. 13, 1976, 51-107552[U]
Int. Cl.[2] G03G *15/10*
U.S. Cl. 118—650 6 Claims

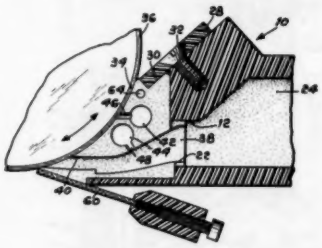


1. In a wet-developing stationary electrode for wet-developing an electrostatic latent image produced on a record sheet, the electrode comprising a plate, the improvement comprising a number of strip-shaped electrodes each acting as a developing electrode and opposed to that surface of said record sheet on which is produced said electrostatic latent image, said strip-shaped electrodes extending along two directions symmetrically inclined with respect to the advancing direction of said record sheet and having rear ends, viewed in the advancing direction of said record sheet, which are divergent toward the front ends thereof, said plate having hole means distributed between said strip-shaped electrodes.

4,133,293
LIQUID FEEDING, PATTERNING AND BLENDING SYSTEM

Richard K. Smejda, 192 Edmund Ave., Paterson, N.J. 07502

Continuation-in-part of Ser. No. 637,167, Dec. 3, 1975, abandoned, which is a continuation-in-part of Ser. No. 430,586, Jan. 3, 1974, abandoned. This application Sep. 23, 1977, Ser. No. 835,904
Int. Cl.[2] B05C *3/18*
U.S. Cl. 118—411 10 Claims



1. A liquid feeding system comprising:
a plurality of longitudinally extending liquid feeding chambers having like-sized outlets disposed successively in a laterally aligned integral assembly and adapted to supply liquid to an adjacent carrier passing across the outlets, and
a plurality of detachable liquid control means mounted in sealing engagement with respective said outlets and extending forwardly from and laterally across said outlets for contacting and applying liquid from said outlets to said carrier, said control means having a front face and including longitudinal passages communicating with said outlets and having selectively shaped solidly bounded openings on said front face of different dimensions than that of said outlets, and cross channels extending laterally through said control means for laterally communicating liquid between selective longitudinal passages of adjacent control means.

4,133,294
PROCESS FOR MARKING MOLLUSCS

Ellis T. Bolton, and Noel D. Dey, both of Lewes, Del., assignors to University of Delaware, Newark, Del.

Filed Apr. 27, 1977, Ser. No. 791,547
Int. Cl.[2] A01K *61/00*
U.S. Cl. 119—4 5 Claims

1. A process for marking permanently the shells of edible molluscs which marking will fluoresce when exposed to ultraviolet light, which process comprises feeding said molluscs with food medium containing tetracycline during the growing stage of the molluscs.

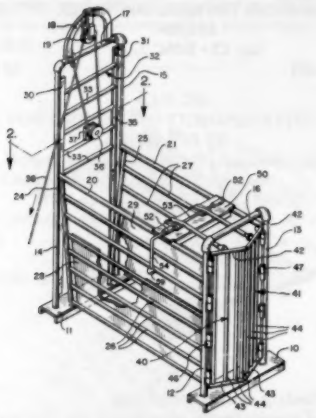
4,133,295
CATTLE GATE FOR RODEO

Ernest L. Jones, Rte. 1, Box 128, Cedaredge, Colo. 81413

Filed Jul. 15, 1977, Ser. No. 815,984
Int. Cl.[2] A01K *1/00*
U.S. Cl. 119—15.5 R 9 Claims

1. An enclosure for a steer, calf, or like animal for use in performing contests at rodeos, comprising a rectangular cage-like structure having side walls, an entrance gate at one end and an exit gate at its opposite end, said exit gate comprising at least one rigid gate member hingedly supported on an upright post of said structure and adapted to swing to open and closed

positions, means for operating said exit gate comprising a supporting plate secured to and bridging the space between the upper portions of said side walls, an operating rod pivoted on said plate and having an arm fixed thereto and extending at an angle therefrom, a link having one end pivotally connected to said arm and its other end pivotally connected to said exit gate, said link extending over said operating rod and downwardly with respect to the axis of said operating rod when said arm is



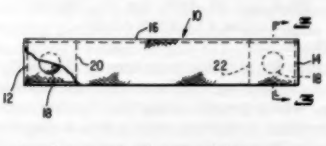
in closed-gate position whereby a straight line passing through the axis of the pivotal connection between said arm and link and the axis of the pivotal connection between said link and gate lies below the axis of said operating rod and whereby said arm and link occupy relative positions beyond dead center for holding said exit gate locked against pressure applied to the inside of said exit gate, and a manually operable handle for said operating rod for rotating said rod and arm to lift the adjacent end of said link to unlock and open said gate.

4,133,296

TOY FOR ANIMALS

Helen A. Smith, 536 Bradford, Pasadena, Calif. 91105

Filed Jul. 13, 1977, Ser. No. 815,292
Int. Cl.² A01K *15/00*
U.S. Cl. 119—29 **11 Claims**



1. A play toy for an animal, comprising:

an elongated tubular member of flexible material, said member having closed sides and ends,

at least one weight part fixed in the member adjacent each of the ends thereof by stitching across said tubular member adjacent the ends to form pockets to contain the weight parts,

said tubular member being generally flat between said pockets,

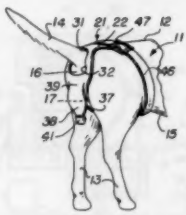
said weight parts being adapted to develop forces in the tubular member from where it is held and moved by an animal, the forces being toward either weight part so that either or both weight parts tend to move around or away from the holding position.

4,133,297

VAGINAL BARRIER FOR ANIMALS

Julian B. Denebeim, 220 Shelter Cove Dr., El Granada, Calif. 94019

Filed Jan. 26, 1977, Ser. No. 762,496
Int. Cl.² A01K *21/00*
U.S. Cl. 119—143 **1 Claim**



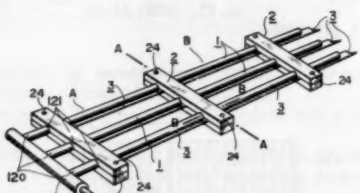
1. A device for the purpose described comprising an elongated member comprising a unitary piece of flexible washable plastic formed near a first end with a first aperture for protrusion of the tail and expose of the anus of the animal to which the device is applied, said first aperture being totally unobstructed, a second aperture separate from said first aperture and formed near a second end opposite said first end defining two straps on either side of said second aperture, a transversely extending portion between said apertures, an apron within said second aperture integral with and flexibly joined to said transversely extending portion, a weight in a pouch on the end of said apron which is downmost in position of use, said apron being unconnected to said member at its lower end, to cause said apron to hang downward over the vulva, said second aperture being unobstructed except by said flexible apron, means comprising a third strap extending from one of said ends adapted to fit around the sides of the animal and cooperating attachment means on the other of said ends and said third strap to hold said member in position.

4,133,298

SOLAR HEAT COLLECTING APPARATUS

Hajime Hayama, Nara, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Sep. 16, 1976, Ser. No. 723,789
Claims priority, application Japan, Sep. 26, 1975, 50-117967; Nov. 28, 1975, 50-144445
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **6 Claims**



1. Solar heat collecting apparatus comprising:

a plurality of heat collecting elements, each of said elements including, a tubular outer member having a circumferential wall portion permeable to radiant solar energy, end portions sealed to said tubular outer member to provide an evacuated space within the outer member, a tubular inner member disposed within the evacuated space of the outer member and having an outer circumferential surface for absorbing solar radiant energy, said tubular inner member having end portions which protrude through respective end portions of the outer member, absorbing means for absorbing the difference between the amounts of heat

expansion and contraction of said outer member and said inner member, and a bladed heat collecting member connected in heat conducting relation to, and extending radially from, the outer surface of the inner member within the evacuated space;

a plurality of means of thermally insulating material for supporting said plurality of heat collecting elements, the end portions of the inner members of the heat collecting elements being connected together inside the support elements;

means for conducting a fluid through the inner members of a plurality of said heat collecting elements connected in series; and

a plurality of valve means for controlling the flow of fluid through a selected number of said inner members, each of said valve means being enclosed in said supporting means and disposed at the connection between the fluid conducting means and the end portion of the inner member of the last heat collecting element of a series of said elements, said supporting means having openings therein for allowing operation of said valve means.

4,133,299

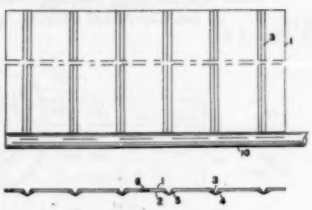
SOLAR HEAT ABSORBER PLATE

Floyd A. Lyon, Brookville, N.Y., assignor to Halm Instrument Co. Inc., Glen Head, N.Y.

Continuation of Ser. No. 705,670, Jul. 15, 1976, abandoned. This application Mar. 29, 1978, Ser. No. 891,174

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—271 **3 Claims**



1. Absorber plate means for liquid heating collectors, comprising,

a cover sheet having a blackened upward surface for absorbing sunlight,

a plurality of straight parallel ridges on the lower surface of said sheet,

an independent back sheet attached to the cover sheet only at its outer edges having an equal number of straight parallel grooves, the spacing of said grooves matching said ridges, and the height of said ridges substantially matching the depth of said grooves, said cover sheet and said back sheet being assembled so that said ridges nest in said grooves, the size of the grooves being small with respect to their spacings,

and a header tube connected perpendicularly to said grooves to feed liquid to said grooves so that the liquid flows only in one direction in said absorber plate,

whereby good heat exchange contact is made between liquid and said absorber plate when said grooves are full of said liquid and when said grooves are only partly full of said liquid.

4,133,300

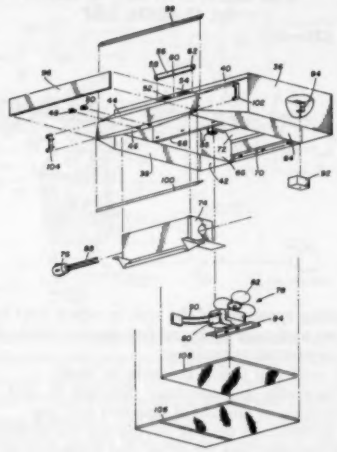
VENTILATING RANGE HOOD

Fred Burton, Jr., Dallas; Marshall N. Gartenlaub, Richardson, and Kenneth E. Sampsel, Dallas, all of Tex., assignors to Home Metal Products Company, Plano, Tex.

Filed Aug. 1, 1977, Ser. No. 820,867

Int. Cl.[2] F24C *15/08;* **F23J** *11/00*

U.S. Cl. 126—299 D **5 Claims**



1. A ventilating range hood having a number of selectable exhaust paths, which comprises:

an enclosure frame having a pair of generally parallel side walls interconnected by front and back walls to form a generally rectangular, box-like enclosure;

a bottom cover comprising air filter means defining an air intake leading to the interior of the enclosure;

an internal baffle mounted within the enclosure spaced above the bottom cover to define an air flow chamber, the internal baffle entending across the interior area defined by the walls and having an opening aligned substantially symmetrically with the air intake;

means mounted within the air flow chamber and aligned with the opening in the internal baffle for drawing air through the intake opening into the enclosure;

a top cover for the enclosure frame having a first removable plate aligned with the opening in the internal baffle;

the first removable plate having a configuration comprising a rectangular portion and a contiguous semicircular portion along one side of the rectangular portion, and providing upon removal an opening in the top cover to receive therein an air flow duct of either a circular or a rectangular cross-sectional shape that serves as an upwardly directed exhaust path through the internal baffle opening for air drawn into the fan chamber;

a second removable plate in the back wall of the enclosure frame providing upon removal an opening for receiving therein an air flow duct that establishes a rearwardly directed exhaust path for air drawn into the fan chamber and through the internal baffle opening;

a third removable plate on the front wall of the enclosure frame providing upon removal access to an opening in the front wall for receiving a set of louvers to establish a forwardly directed exhaust path for air drawn into the fan chamber and through the internal baffle opening; and

the top cover of the enclosure and the first removable plate are provided with cooperating attachment means for securing the first removable plate, after its removal from the top cover, to a section of the top cover adjacent the opening created by its removal to overlay the semicircular portion of the opening and define a substantially rectangular opening in the top cover.

4,133,301
GAS HEATING METHOD AND APPARATUS

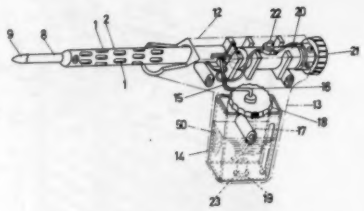
Akinobu Fujiwara, 3204 Shimohatsukari Hatsukari-cho, Otsuki City, Japan (409-11)

Claims priority, application Japan, Jul. 29, 1976 51/90610, Dec. 7, 1976, 51/146816 Dec. 7, 1976, 51/146815, Mar. 30, 1977 52/35769

Filed Jun. 8, 1977, Ser. No. 804,757

Int. Cl.[2] B23K *3/02*

U.S. Cl. 126—413 **23 Claims**



1. Heating apparatus of the type in which heat is produced by burning a mixture of air and fuel gas in a combustion chamber, the apparatus comprising:

a heat insulating casing holdable by hand;

a rechargeable gas container disposed in said casing for containing an amount of liquefied fuel gas;

a gas introduction passage having one end immersed in said gas container and the other end extending to later-mentioned air-gas mixing means, said other end having a gas outlet nozzle;

gas-flow adjusting means interposed in said gas introduction passage for feeding an adjusted amount of gas under suction from said gas container;

gas vaporizing means interposed in said gas introduction passage for feeding a vaporized state gas to later-mentioned air-gas mixing means;

air-gas mixing means for mixing said vaporized gas from said gas vaporizing means with fresh air from the atmosphere, said air-gas mixing means having an outlet nozzle from which a jet of air-gas mixture is supplied and having air inlet aperture therein;

a combustion chamber extending from said casing and having apertures on the periphery thereof, for having an introduction of said jet of air-gas mixture therein, said combustion chamber including two carriers carrying catalyzing substances of different character disposed therein for promoting the oxidation reaction of said jet of air-gas mixture;

a heat conducting rod extending from said combustion chamber having a heating tip at one end; and

ignition circuit means for igniting said jet of air-gas mixture in said combustion chamber, said ignition means including electrical power source, ignition means and means for selectively closing said ignitiion circuit means for connecting said power source and ignition means.

4,133,302
INFANT INCUBATOR

John A. McGrath, Mooroolbark, and Murray R. Robertson, Reservoir, both of Australia, assignors to The Commonwealth Industrial Gases Limited, Australia

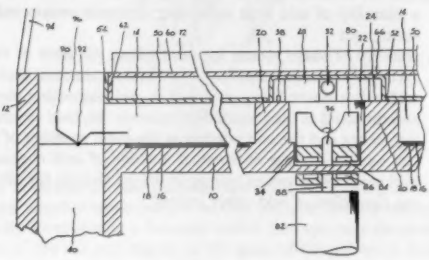
Filed Apr. 29, 1977, Ser. No. 792,372

Claims priority, application Australia, Apr. 30, 1976, PC5755

Int. Cl.[2] A61G *11/00*

U.S. Cl. 128—1 B **12 Claims**

1. An infant incubator comprising a plurality of wall panels, a patient support tray cooperating with at least some of said wall panels to form an occupant compartment having said patient support tray as the floor thereof, a plate disposed beneath said support tray and cooperating with said support tray and at least some of said wall panels to define a return flow path for taking atmosphere from said compartment, substantially the entire undersurface of said support tray and substantially the entire upper surface of said plate forming boundaries of said return flow-path, a base beneath said plate and having a floor directed towards said plate, said base cooperating with said plate and at least some of said wall panels to define an atmosphere delivery path communicating with said return flow path, substantially the entire undersurface of said plate and substantially the entire floor of said base forming boundaries of said delivery path, said base and at least some of said wall panels cooperating to provide a housing for said incubator, impeller means to withdraw atmosphere from said compartment through said return flow path for delivery along said delivery path back to said compartment, low temperature, high surface area heater means distributed over a major portion of said base floor in heat transfer relationship to atmosphere proceeding to said compartment, and means for adding make-up atmosphere to the atmosphere proceeding to said compartment.



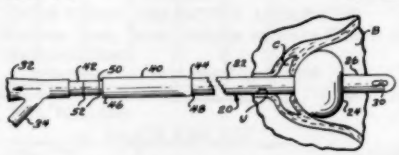
4,133,303
HEMOSTATIC CATHETER AND METHOD

Bhupendra C. Patel, Elgin, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Apr. 28, 1977, Ser. No. 791,668

Int. Cl.[2] A61M *25/00*

U.S. Cl. 128—2 S **32 Claims**



1. A tension indicating device for use on a patient comprising, elongated conduit means having means for retaining a distal portion of the conduit means in the patient, reference means on the device defining a reference position, and an elastic portion adjacent and movable relative to the reference position of said reference means responsive to application of force against the conduit means proximal the reference means to provide an indication of the tension in the conduit means.

4,133,304
SYRINGE-LIKE APPARATUS WITH REMOVABLE CAPILLARY CARTRIDGE

Donald L. Bailey, Thornton, Colo., assignor to EMDE Corporation, Reno, Nev.

Filed Apr. 29, 1977, Ser. No. 792,241

Int. Cl.[2] A61B *5/00*

U.S. Cl. 128—2 F **39 Claims**

1. Apparatus for use with a hypodermic needle to collect at least one blood sample, comprising:

a housing member comprising an elongated center chamber and an end member terminating the center chamber, the end member having means for connecting a hypodermic

needle thereto, and the end member further having bore means extending through the end member adapted for fluid communication between the center chamber and a connected hypodermic needle;

a hollow capillary tube positioned within the center chamber of said housing member in a stationary manner, said capillary tube comprising fluid inlet means and fluid outlet

means connected for fluid communication therebetween, and

sealing means for releasably retaining and connecting the fluid inlet means of said capillary tube to the bore means of the end member of said housing member in a fluid tight relationship for fluid communication through the bore means into the fluid inlet means.

4,133,305

RELAXATION APPARATUS INCLUDING MATTRESS AND PNEUMATIC VIBRATING DEVICE

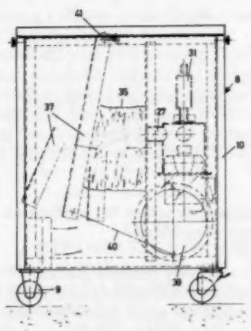
Rudolf Steuer, Oudelandstraat 54, 's-Gravenzande, Netherlands

Filed Mar. 11, 1977, Ser. No. 777,156

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1976, 2611151

Int. Cl.[2] A61H *1/00*

U.S. Cl. 128—33 **17 Claims**



1. A relaxation apparatus comprising: a mattress consisting essentially of an inflatable hollow body defining an interior space and having an upper reclining surface area made of a flexible material for carrying a human body in its entirety; an air pump connected to said hollow body for inflating said hollow body with air and for creating and maintaining a preselected pressure in the interior space of said hollow body; and vibrating means cooperating with said pump for periodically varying with a preselected frequency said pressure in the interior space of said hollow body and for periodically raising and lowering said reclining surface area, said vibrating means including a control system for varying said preselected frequency within a range containing breathing rates.

4,133,306

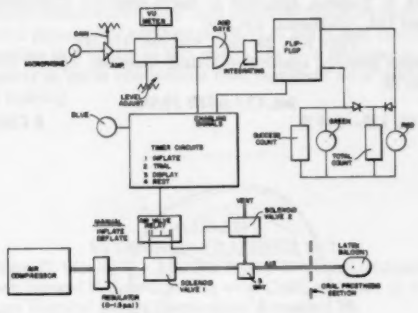
PALATAL EXERCISER CONTROL DEVICE

Robert A. Berry, 3323 Longhorn Rd., SW., Roanoke, Va. 24018

Filed Jan. 6, 1977, Ser. No. 757,448

Int. Cl.[2] A61H *7/00*

U.S. Cl. 128—64 **3 Claims**



1. Apparatus for conducting a palatal exercise in a patient using an inflatable oral prosthesis having means for controlling the inflation and deflation of said prosthesis, means responsive to said patient's voice manifestations during said exercise when said prosthesis is inflated, and monitoring means under control of said responsive means whereby said patient is enabled to regulate said manifestations by observation thereof.

4,133,307

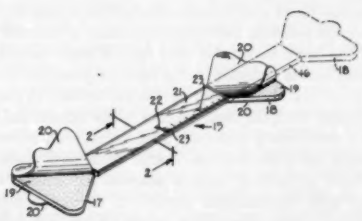
TRACTION DEVICE

Richard A. Ness, Fergus Falls, Minn. 56537

Filed May 9, 1977, Ser. No. 795,174

Int. Cl.[2] A61H *1/02*

U.S. Cl. 128—75 **3 Claims**



1. A traction device comprising:

(a) an elongated strip of elastic material of given width;

(b) end portions at the opposite ends of said strip of greater width than said strip and having normally flat opposite sides;

(c) an adhesive coating on one of said flat sides of one of said end portions for adhesive engagement with an object to which traction is to be applied;

(d) adhesive coatings on the opposite sides of the other one of said end portions;

(e) a fastening member being adhered in use to a selected one of said opposite sides of said other one of said end portions and having anchoring elements thereon capable of piercing textile fabric when said fastener member is pressed into engagement with said fabric;

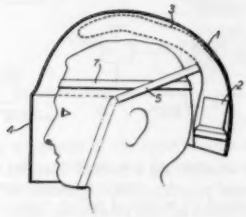
(f) and means including an elongated inelastic member anchored at one end adjacent one of said end portions and extending along said strip for indicating the amount of elongation of said strip when the strip is subjected to

tensile stress, said strip and inelastic member having tension measuring indicia thereon.

4,133,308
PROTECTIVE DEVICES

Brian A. Lowe, Cheshunt, and Raymond Odell, Potters Bar, both of England, assignors to Racal-Amplivox Communications Ltd., Middlesex, England

Filed Feb. 24, 1977, Ser. No. 771,781
Claims priority, application United Kingdom, Apr. 7, 1976, 14194/76
Int. Cl.[2] A62B *18/00*
U.S. Cl. 128—145 R **5 Claims**



1. An improved anti-dust helmet including a hollow helmet shell member having inner and outer surfaces, said helmet shell member containing a lower open portion for receiving a user's head, and an open front viewing portion; air circulation means arranged within the rear portion of said helmet shell member for directing air forwardly of the helmet; supporting harness means connected within the helmet shell member for spacing the inner surface thereof from the user's head; transparent visor means mounted across the helmet open front viewing portion, said visor means being connected at its upper edge portion with said helmet shell member and being adapted at its side edges for sealing engagement with the user's face;

the improvement which comprises sealing means for sealing the space between the occipital portion of the user's head and the inner surface of said helmet shell member, said sealing means including a soft resilient generally U-shaped member having an outer peripheral surface in sealed engagement with the inner surface of the helmet shell member, a deformably generally planar web portion extending radially inwardly from said outer peripheral surface, and an inner peripheral surface adapted for sealing engagement with the occipital portion of the user's head, said sealing member containing an air circulation opening in fluidic communication with said air circulation means, whereby air from said circulation means passes through said opening forwardly of the helmet.

4,133,309
SORBENT MATERIAL AND A RESPIRATOR CONTAINING THE SORBENT MATERIAL

Gunter A. Kohler, Grant Township, Washington County, and Leon W. Anders, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

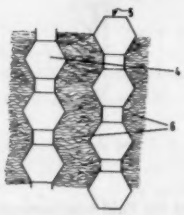
Filed May 13, 1977, Ser. No. 796,709
Int. Cl.[2] A62B *7/10, 23/06*
U.S. Cl. 128—146.6 **7 Claims**

1. Granular sorbent material for the removal of sulfur dioxide and HCl from ambient air at room temperature comprising alumina granules having coated thereon a MnO_x-Al_2O_3 complex, said manganese being present in a valence state of from plus 2.5 to plus 3.5, x thus being 1.25 to 1.75.

4,133,310
POLYMER FABRIC

Ronald Lloyd; William O. Murphy, both of Sawbridgeworth; Albert G. Patchell, Welwyn Garden City, and Peter J. Herbert, Bishops Stortford, all of England, assignors to Smith & Nephew Research Limited, Harlow, England

Filed Oct. 30, 1975, Ser. No. 627,347
Claims priority, application United Kingdom, Jan. 11, 1974, 47403/74; Jan. 11, 1974, 47416/74
Int. Cl.[2] A61L *15/00*
U.S. Cl. 128—156 **6 Claims**

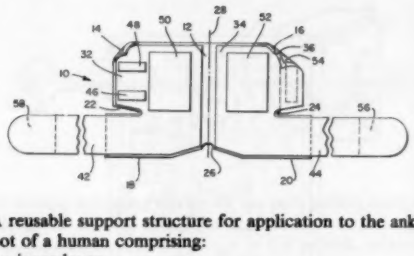


1. A non-woven fabric made of thermoplastic polymer material and comprising a plurality of parallel chain-like structures each having raised bosses spaced along its length, said bosses being interconnected by a non-fibrous membrane or by a fibrillated area comprising a multitude of fibers, the said structures being themselves interconnected by further distinct fibrillated areas comprising a multitude of fibers, the fibers in these said further areas being predominantly oriented in one direction or at an angle not greater than 45° to said one direction, the fabric having good tear at least in said one direction.

4,133,311
ANKLE SUPPORT STRUCTURE

Robert A. Karczewski, P.O. Box 651, Middleboro, Mass. 02346

Filed May 5, 1977, Ser. No. 794,027
Int. Cl.[2] A61F *13/06*
U.S. Cl. 128—166 **9 Claims**



1. A reusable support structure for application to the ankle and foot of a human comprising:

A. an inner layer
   i. formed of a relatively resilient material,
   ii. having dimensions that enable said layer to be resiliently wrapped around the ankle above the foot, and
   iii. having an inside surface for facing inwardly against the ankle and an outside surface;

B. an outer layer
   i. comprising first and second separate, essentially mirror image outer layer sections secured in spaced apart positions to the outside surface of said inner layer,
   ii. each of said outer layer sections being formed of a relatively non-resilient, flexible material; and

C. first and second elongated straps
   i. formed of a relatively non-resilient, flexible material,
   ii. including respective first ends secured to said first and second outer layer sections, respectively, and respective free ends, and
   iii. having respective lengths extending from said outer layer sections that are essentially equal and that enable

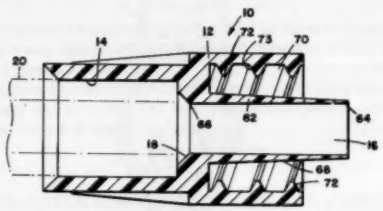
said first and second straps to be crossed over the top of the foot, wrapped downwardly along first and second opposite sides, respectively, of the foot, crossed under the foot, wrapped upwardly so as to extend essentially parallel to the axis of the leg along the second and first sides, respectively, of the foot and secured under tension in the leg axis parallel position to to said outer layer sections at opposite sides of the ankle, said first and second straps thereby providing a stirrup-like support against eversion and inversion of the ankle.

4,133,312

CONNECTOR FOR ATTACHMENT OF BLOOD TUBING TO EXTERNAL ARTERIOVENOUS SHUNTS AND FISTULAS

Samuel Burd, Oakland, Calif., assignor to Cordis Dow Corp., Miami, Fla.

Filed Oct. 13, 1976, Ser. No. 731,865
Int. Cl.[2] A61M *5/00*; F16L *47/00*
U.S. Cl. 128—214 R **5 Claims**



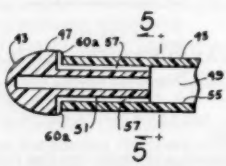
1. A universal connector having a blood tube connector on one end and universal connector means on the opposite end comprising a first means and a second means for selective connection and disconnection on the inner or outer tapered surface of a common sleeve member with the connector portion of a fistula and of an external arteriovenous shunt, said first means comprising a gradually inwardly end to end tapering internal surface for a press fit connection between mating surfaces on said connector portion and said internal surface, and said second means comprising an outwardly end to end tapering external surface of said first means and a threaded portion encircling a portion of the length of said first means for forming a locking connection between the connector portion of a fistula and an external arteriovenous shunt between mating surfaces on said connector portion and said externally tapered surface on said first means and said threaded portion thereby effecting a selected fluid-tight seal between said connector portion of said fistula and said external arteriovenous shunt and said first and said second means of said universal connector means.

4,133,313

EXPANDABLE SYRINGE

Vincent R. Sneider, 3422 Hallcrest Dr. NE., Atlanta, Ga. 30319

Continuation-in-part of Ser. No. 591,612, Jun. 30, 1975, Pat. No. 3,993,070. This application Nov. 22, 1976, Ser. No. 744,046
Int. Cl.[2] A61M *1/00*
U.S. Cl. 128—232 **7 Claims**



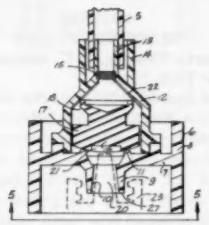
1. An expandable syringe comprising an elastic bag having an opening through which liquid may pass; a resilient nozzle including a generally cylindrical tubular body defining a central passageway extending therethrough and a tip member removably mounted on a free end of said tubular body, said tip member having a plurality of radially spaced peripheral ports and a hollow hub extending axially within said tubular body and spaced from the inner surface of said tubular body, and a plurality of axially extending ribs joining said hub with said tubular body inner surface to define a plurality of axially extending channels providing fluid communication between said central passageway and said plurality of ports; and means for mounting said nozzle to said elastic bag with said central passageway in valve controllable fluid communication with said bag opening.

4,133,314

EXTENSION TRANSFER SET

William G. Bloom, Los Angeles; Pradip V. Choksi, Northridge, and Edmund E. Spaeth, Irvine, all of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Dec. 6, 1976, Ser. No. 747,418
Int. Cl.[2] A61J *1/00*
U.S. Cl. 128—272.3 **16 Claims**



1. An extension transfer set for filling a plurality of syringes or the like from a reservoir container comprising: a flexible tube; a reservoir connector attached to one end of the tube; a syringe coupler connected to an opposite end of the tube, said coupler including a valve having means that opens upon insertion of a blunt syringe tip into the coupler and closes upon removal of such syringe tip; said coupler having a forwardly extending internally tapered syringe tip sealing sleeve; and a protector skirt projecting forwardly beyond said sealing sleeve and spaced radially outward therefrom to define an annular recess of a size to receive a conventional threaded collar surrounding a tapered syringe tip, said sealing sleeve having a wall sufficiently thin to be received between such conventional syringe tip and surrounding threaded collar.

4,133,315

METHOD AND APPARATUS FOR REDUCING OBESITY

Edward J. Berman, and George A. Rowe, both of 3426 N. Meridian, Indianapolis, Ind. 46208

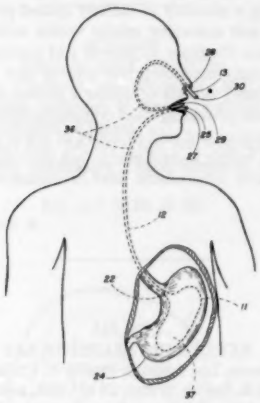
Filed Dec. 27, 1976, Ser. No. 754,568
Int. Cl.[2] A61B *17/00*
U.S. Cl. 128—303 R **12 Claims**

1. A method of reducing obesity in human beings which comprises:

placing an inflatable bag in a human being's stomach;

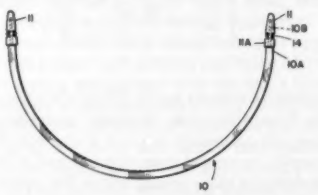
after said placing, causing the inflatable bag to be inflated to a sufficient size to cause a suppression of appetite;

allowing the inflatable bag to remain in the stomach while the human being is eating; and



alternately inflating and deflating the bag and having the human being eat orally by placing food in the mouth and swallowing.

4,133,316
BRASSIERE FRAME
Herbert L. Schwartz, Flushing, N.Y., assignor to S & S Industries, Inc., New York, N.Y.
Filed Jun. 23, 1977, Ser. No. 809,483
Int. Cl.[2] A41C *1/14*
U.S. Cl. 128—476 **10 Claims**

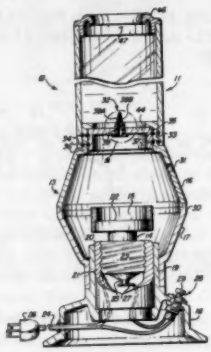


10. A protective device for the end of a flat wire, adapted particularly for use on a breast supporting wire in a brassiere, comprising an elongate cover member of resilient or plastic material having an internal bore of rectangular cross-section extending from one end of said cover member, and a hole extending transversely through a wall of the cover member to a narrow side of said rectangular cross-section of said bore, said wire being a narrow flat rectangular wire having a shaped tip portion at the end thereof, said tip including a locking projection extending from an edge of the wire and being received in the hole of said cover member when the tip portion is positioned in the bore in said cover member.

4,133,317
SMOKABLE MATERIAL AND METHOD FOR PREPARING SAME
Theodore S. Briskin, Beverly Hills, Calif., assignor to Philip Morris Incorporated, New York, N.Y.
Division of Ser. No. 562,735, Mar. 27, 1975, Pat. No. 4,019,521, which is a continuation of Ser. No. 367,477, Jun. 6, 1973, abandoned. This application Dec. 23, 1976, Ser. No. 754,011
Int. Cl.[2] A24D *1/18*
U.S. Cl. 131—2 **7 Claims**

1. A smokable material comprising the product of the thermal reaction which includes the steps of exposing a carbohydrate material selected from the group consisting of cellulose, cellulosic derivatives, starch, pectin, polyvinyl alcohol, gum and alginates to a temperature of from about 350° to about 750° C for a time sufficient to effect a weight loss of at least about 50% but not more than 90%, said time being not more than about 10 minutes, maintaining the material in a non-oxidizing gas during the heat treatment, and then processing the thermally reacted product to a form desired for the smoking material.

4,133,318
WATER PIPE
Ronald Gross, 2134 W. Weldon Ave., and Jimmy L. Whitfill, 2407 W. Weldon Ave., both of Phoenix, Ariz. 85015
Filed Jun. 20, 1977, Ser. No. 808,110
Int. Cl.[2] A24F *1/14, 1/30*
U.S. Cl. 131—173 **11 Claims**

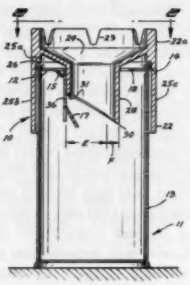


1. A tubular water pipe comprising:
a base structure comprising a first chamber containing an organic material burning unit,
a second inhalation and water chamber connected at one end to said first chamber in axial alignment therewith,
means separating in water tight arrangement said first and second chambers,
means between said first and second chambers containing a one-way valve for transferring gas created by the burning of the material in said first chamber into said second chamber,
an organic material burning unit mounted in said first chamber,
said burning unit comprising an electric heating element and a bowl in heat transfer relationship, said bowl being provided for holding the material to be burned,
an electric switch means mounted on said water pipe and connectable to an electric source for selectively energizing said heating element, and
a mouthpiece mounted on the other end of said second chamber,
whereby suction applied by a smoker to the mouthpiece draws gases of the burning material passing through said one-way valve and the water into the mouth of the smoker.

4,133,319
CAN SUPPORTED ASHTRAY
Ellis L. Bloomfield, Box 278, Hector, Minn. 55432
Filed Feb. 17, 1977, Ser. No. 769,706
Int. Cl.[2] A24F *19/00, 19/10*
U.S. Cl. 131—241 **20 Claims**

12. In combination, a beverage can that includes a peripheral top bead having a bead top and a can top at a lower elevation than the bead top, said can top having an opening, and an ash receiver device having a punch portion extending through the can top opening and in abutting relationship to the can top, said

punch portion having an opening therethrough that opens into the can, and means abutting against the bead and joined to the punch portion for receiving ashes and directing ashes to the punch portion opening, the above mentioned means including an upper portion having a slot for holding a cigarette, a tapered



surface portion surrounding and joined to the punch portion to extend away therefrom in an upward direction above the can top for directing ashes toward the punch portion opening and means joined to the tapered surface portion for abutting against the bead top to retain the tapered surface portion vertically spaced from and above the can top.

4,133,320

APPARATUS FOR DETERMINING THE INJECTED FUEL QUANTITY IN MIXTURE COMPRESSING INTERNAL COMBUSTION ENGINES

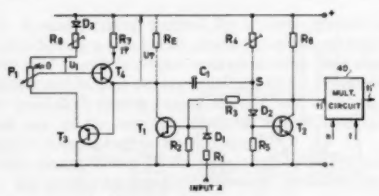
Valerio Bianchi, Hochdorf, and Reinhard Latsch, Vaihingen, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Dec. 5, 1975, Ser. No. 638,092

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1974, 2457434

Int. Cl.² F02B *3/00*

U.S. Cl. 123—32 EA **16 Claims**



1. In an apparatus for determining the correct fuel quantity to be injected by injection valves into an internal combustion engine, said apparatus including at least a first transducer for generating pulses dependent on engine r.p.m. and a second transducer for engine throttle valve position, an electonic circuit including first and second semiconductor switching elements connected to form a monostable multivibrator the feedback branch of which includes a timing capacitor and means connecting said first transducer to one of said switching elements, the improvement comprising:

said electronic circuit further contains a charging current source being connected to said timing capacitor and said charging current source includes means for altering the magnitude of said charging current in dependence on the position of the engine's throttle and further includes electronic means for altering the charging current in dependence on the potential at said capacitor, and means terminating the charging process of said timing capacitor by switchover of said monostable multivibrator triggered by the arrival of rpm-dependent pulses, and whereby the charge on said capacitor contains rpm-dependent valve opening information which can be used without interposition of rpm-dependent distributor means.

4,133,321

CLAMPING DEVICE FOR FUEL INJECTION NOZZLES

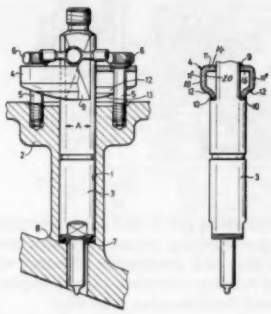
Karl Hofmann, Aldingen, and Walter Mladek, Stuttgart, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Continuation of Ser. No. 423,761, Dec. 11, 1973, abandoned. This application May 31, 1977, Ser. No. 802,098

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1972, 2262570

Int. Cl.² F02M *39/00*

U.S. Cl. 123—32 R **3 Claims**



1. In combination, an injection nozzle, a cylinder head of an internal combustion engine, a clamping device in the form of a bracket for use in clamping the fuel injection nozzle to the cylinder head, and fastening means for fastening opposite, longitudinally extending top end sections of the clamping device to the cylinder head, said clamping device comprising:

(a) a generally flat top portion having substantially parallel top and bottom surfaces, defining a centrally disposed slot formed therein for receiving therethrough a portion of the injection nozzle, and including said opposite longitudinally extending end sections adapted for use with the fastening means; and

(b) two parallel leg portions extending from opposite sides of said top portion each having substantially parallel side surfaces perpendicular to the top and bottom surfaces of said top portion, said leg portions and said top portion defining, throughout their longitudinal extent, a U-shaped cross-sectional profile with the free end of each of said legs defining a bearing surface which faces the cylinder head, said legs being adapted, when said device is assembled with the injection nozzle and means fastening said clamping device to the cylinder head, to bear against a respective flattened portion on the injection nozzle.

4,133,322

INTERNAL COMBUSTION ENGINE

Hirokazu Nakamura; Tsuneo Ohinouye, both of Kyoto; Kenji Hori; Yuhiko Kiyota, both of Nagaokakyo; Tatsuro Nakagami, Kyoto; Yutaka Tsukamoto, Joyo, and Katsuo Akishino, Kameoka, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 19, 1976, Ser. No. 706,323

Claims priority, application Japan, Apr. 2, 1976, 51-37349

Int. Cl.² F02B *75/02*; F02M *23/04*

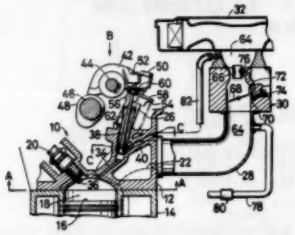
U.S. Cl. 123—75 B **14 Claims**

1. In an internal combustion engine of the type having; a single combustion chamber having an intake port and an exhaust port; a main intake passage for introducing into said intake port an air-fuel charge mixture produced in a mixture

charge producing device; a throttle valve disposed in said main intake passage; a spark plug threaded in a wall of a cylinder head, with a spark gap thereof located in a given position within said combustion chamber; and a piston operating within a cylinder block attached to said cylinder head; the improvement characterized by:

(a) an injection hole open in said wall of said cylinder head constituting said combustion chamber, said injection hole directed to the vicinity of the spark gap in said wall to obtain a high speed jet flow having a directional characteristic;

(b) a sub-intake passage connected to said injection hole;



(c) means for supplying gas to said sub-intake passage under a sufficient gas-supplying pressure by high level vacuum generated within said combustion chamber even during the low-load running condition of said engine when the opening of said throttle valve is small;

(d) a sub-intake valve provided in said cylinder head for opening and closing said sub-intake passage; and,

(e) an actuating mechanism for opening said sub-intake valve during a suction stroke whereby a high speed gas is injected with strong force from said injection hole into said combustion chamber to remove the combustion gas existing around the spark gap and promote a swirling action and turbulence of said air-fuel mixture.

4,133,323

CONTROL TRIGGER GENERATING SYSTEM, PARTICULARLY TO GENERATE A TRIGGER SIGNAL USED IN INTERNAL COMBUSTION ENGINES, SUCH AS AN IGNITION OR FUEL INJECTION TRIGGER SIGNAL

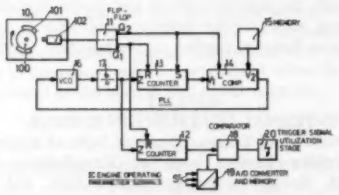
Karl-Heinz Adler, Leonberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 16, 1977, Ser. No. 825,094

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1976, 2640791

Int. Cl.[2] F02Q *5/04*

U.S. Cl. 123—117 R **29 Claims**



1. Controlled trigger signal generating system to provide a trigger signal to trigger an event in dependence on rotation of the shaft (100) of an engine, particularly for generation of a trigger signal used in internal combustion engines to trigger an ignition or fuel injection event in dependence on rotation of the crankshaft of the engine, comprising

a first counter (12, 12') counting to a first predetermined count state;

a frequency controllable oscillator (16) generating pulses and connected to the first counter (12, 12'), so that said first counter will count pulses from the oscillator to said first predetermined count state;

signal generator means (10) coupled to the shaft (100) of the engine and providing

(a) a count start signal, and

(b) an angular shaft rotation termination signal, representative of rotation of the shaft (10) through a predetermined angle after generation of the count start signal,

said count start signal being connected to said first counter (12) to cause said first counter to commence counting;

means (18, 20) connected to said first counter (12, 12') and providing said trigger signal when the counter has reached said first predetermined count state;

a second counter (13) connected to said frequency controllable oscillator (16) so that said second counter will count pulses from the oscillator (16) said count start signal being connected to the second counter to cause the second counter to count, and said termination signal being connected to said second counter to control the second counter to stop counting, to control the count duration of said second counter by said angular shaft rotation signals so that the counter will count during the interval when the shaft (10) turns through said predetermined angle;

and a phase locked loop circuit, of which said frequency controllable oscillator (16) and said second counter (13) are parts, so that the time when said first counter (12, 12') will have reached said predetermined count state will be controlled in dependence on the frequency of the controllable oscillator (16) and hence the time interval during rotation of the shaft through said predetermined angle.

4,133,324

IGNITION TIMING CONTROL FOR ENGINE

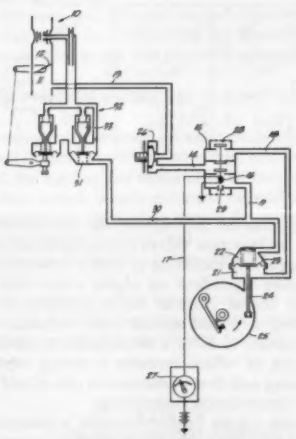
Toru Yagi, and Akihisa Nakamura, both of Tokyo, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 29, 1977, Ser. No. 811,244

Claims priority, application Japan, Jul. 7, 1976, 51-89348[U]

Int. Cl.[2] F02P *5/04*

U.S. Cl. 123—117 A **3 Claims**



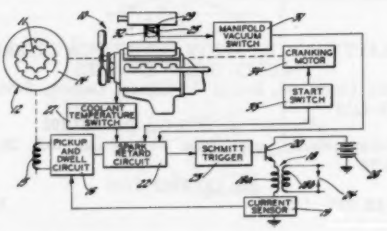
1. For use with an internal combustion engine connected to drive a vehicle, the engine having an intake passage for an air-fuel mixture and provided with a throttle valve, the improvement comprising, in combination: a vacuum line communicating with the intake passage downstream from the throttle valve, a three-way valve connected to said vacuum line, means including a movable member for controlling the ignition timing of said engine, a vacuum responsive device including a flexible diaphragm connected to said member, walls forming a

spark advance chamber on one side of said diaphragm and forming a spark retard chamber on the other side of said diaphragm, a first conduit connecting said three-way valve to said spark advance chamber, a second conduit connecting said three-way valve to said spark retard chamber, electromagnetic means for moving said three-way valve to connect said vacuum line to either said first first conduit or to said second conduit, a valve responsive to engine temperature acting to close said vacuum line when the engine temperature falls below a predetermined value, an electric circuit for operation of said electromagnetic means, said circuit including a switch sensitive to vehicle velocity and acting to de-energize said electromagnetic means when the vehicle velocity exceeds a predetermined value, an additional fuel supply system connected to said intake passage and having a valve operated by vacuum pressure, and a third conduit connected to said second conduit to close the latter said valve to cut off the additional fuel supply when the spark is retarded.

4,133,325
ENGINE SPARK TIMING SYSTEM AND METHOD WITH SUPPLEMENTARY RETARD IN NORMAL AND STARTING MODES

Gene A. West, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 9, 1977, Ser. No. 832,004
Int. Cl.² F02P *5/14*
U.S. Cl. 123—117 R **3 Claims**



1. A spark timing control for a spark ignited combustion engine having a crankshaft characterized by a range of normal rotational speeds in engine operation other than during engine starting and further having cranking means actuatable to rotate the crankshaft during engine starting at a cranking speed less than any of the normal rotational speeds, the spark timing control comprising, in combination:

first means driven by the crankshaft and effective to generate normal spark timing signals at predetermined angles of crankshaft rotation;

second means responsive to each normal spark timing signal to generate therefrom, a retarded spark timing signal retarded from the normal spark timing signal by a predetermined angle of crankshaft rotation, the second means comprising bidirectional ramp means including capacitance means normally having a first capacitance effective to establish first ramping time rates but further having a selectable second capacitance greater than the first capacitance and effective to establish second ramping time rates slower than the first ramping time rates in substantially equal proportion;

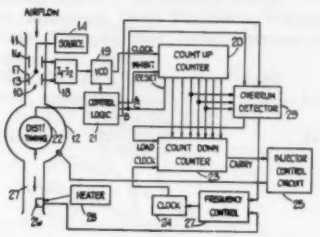
third means responsive to a first predetermined set of engine operating conditions to select the normal spark timing signals for engine spark timing control and responsive to one of a) a second set of engine operating conditions and b) actuation of the cranking means to select the retarded spark timing signals for engine spark timing control; and

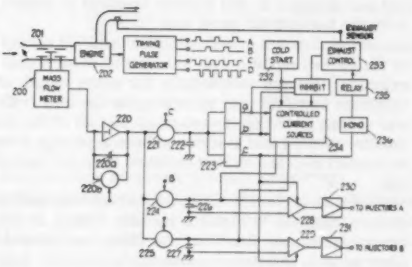
fourth means responsive to actuation of the cranking means to select the second capacitance of the second means, whereby the ramping time rates are slowed proportionally to enable the bidirectional ramp means to operate without clipping at the cranking speed and thus maintain the predetermined crankshaft angle of retard in the retarded spark timing signals.

4,133,326
FUEL CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Michael H. Cops, Solihull, and Clive R. Sainsbury, Birmingham, both of England, assignors to Lucas Industries, Ltd., Great Britain

Filed Oct. 18, 1976, Ser. No. 733,680
Claims priority, application United Kingdom, Oct. 22, 1975, 43281/75
Int. Cl.² F02B *3/00*; G06F *15/50*
U.S. Cl. 123—119 EC **8 Claims**





1. A fuel control system for an internal combustion engine, including a fuel flow control sensitive to at least one engine operating parameter and controlling the rate at which fuel is introduced into the engine, an exhaust gas sensing device for producing an output signal corresponding to the exhaust gas composition, and feedback means for feeding a signal derived from said output signal back to the fuel flow control to correct the fuel flow, wherein the improvement comprises a signal storage device in said feedback means, the stored signal being altered in accordance with variations in the output signal of the exhaust gas sensing device, and overrun detection means connected to said feedback means and arranged to prevent alteration of said stored signal by the exhaust gas sensing device during overrun.

4,133,327
FUEL VAPORIZING HEAT EXCHANGER FOR AN INTERNAL COMBUSTION ENGINE

Mitsumasa Inoue, Yokohama, Japan, assignor to Nissan Motor Company, Ltd., Japan

Filed Jun. 14, 1977, Ser. No. 806,514
Claims priority, application Japan, Jun. 18, 1976, 51/79835[U]
Int. Cl.² F02M *31/02*
U.S. Cl. 123—122 AC **9 Claims**

1. A fuel vapourizing heat exchanger in combination with an internal combustion engine, said engine having

an induction manifold fluidly connected to a combustion chamber,

an air-fuel mixture forming means operatively disposed with said induction manifold, said air-fuel mixture forming means being arranged to supply an air-fuel mixture through the inducton manifold to said combustion chamber for combustion therein, said induction manifold being formed with a riser and at least one branch passage, said at least one branch passage providing fluid communication between said riser and said combustion chamber; and

an exhaust manifold operatively connected to the engine to receive the hot exhaust gases therefrom; said heat exchanger comprising:

heat pipe heat conducting means including a plurality of heat pipes each of which has:

a first end disposed in said exhaust manifold to absorb heat from the hot exhaust gases, and

a second end disposed in said induction manifold to emit heat to the air-fuel mixture, said second end of each heat pipe extending through substantially the entire length of the induction manifold riser so as to cross the inlet orifice of said at least one branch passage, so that all of the air-fuel mixture entering said at least one branch passage is heated by contact with and by heat radiation from said heat pipes; and

exhaust gas flow control means operatively disposed in the exhaust manifold to direct a variable volume of exhaust gases against said first heat absorbing end of said heat pipes so as to maintain a substantially constant predetermined temperature at said heat emitting end of the heat pipe conducting means.

4,133,328

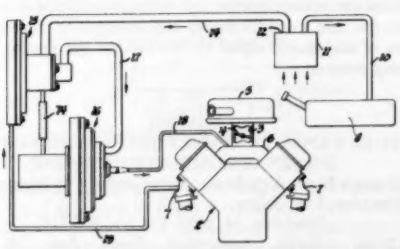
PROPORTIONAL FUEL VAPOR PURGE FLOW CONTROL APPARATUS

Jack B. King, Royal Oak, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 5, 1977, Ser. No. 812,444

Int. Cl.² F02M *59/00*

U.S. Cl. 123—136 **3 Claims**



1. In a vapor recovery system for an internal combustion engine having an induction system with a throttle valve controlling flow therethrough, an exhaust system for discharged exhaust gases and a fuel reservoir means, a proportional purge flow apparatus including: a variable flow control valve including a housing having an inlet connectable to the fuel reservoir means for receiving fuel vapor discharged from the fuel reservoir means, an outlet and a passage including an aperture therebetween, a valve mechanism disposed in said housing and having a valve head positioned to variably control flow through said aperture and pressure means responsive to exhaust gas pressure in the exhaust system operatively connected to said valve mechanism to effect movement of said valve head in an opening direction relative to said aperture, a vacuum regulator valve including a valve housing means having an inlet means operatively connected to said outlet, an outlet means connectable to the induction system downstream of the throttle valve and a flow chamber means therebetween, a regulator valve mechanism disposed in said valve housing in position to regulate flow through said outlet means and vacuum pressure means responsive on one side to induction vacuum pressure downstream of the throttle valve operatively connected to said regulator valve mechanism to effect movement of said regulator valve mechanism in a closing direction relative to said outlet means with increases in induction vacuum pressure and, conduit means connected at one end to receive fuel vapor pressure upstream of said aperture relative to the direction of flow from said inlet to said outlet and connected to be in communication at its other end with the opposite side of said vacuum pressure means whereby said vacuum regulator valve is operative to regulate the vacuum at said inlet means to maintain a constant differential pressure across said variable flow control valve.

4,133,329

ELECTRONIC IGNITION DEVICE FOR INTERNAL COMBUSTION ENGINES

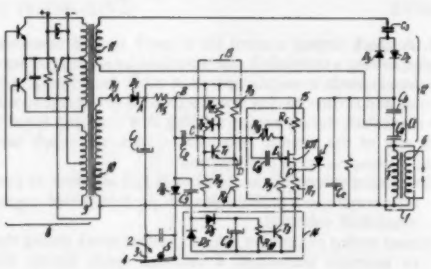
Charles Caron, 64, avenue du Lignon, Geneva, Switzerland CH-1219

Filed Jul. 20, 1976, Ser. No. 707,102

Claims priority, application Switzerland, Jul. 29, 1975, 9842/75

Int. Cl.² F02P *3/06*

U.S. Cl. 123—148 CB **2 Claims**



1. An electronic ignition device for an internal combustion engine, comprising a tripping device for controlling ignition, an ignition coil, a capacitor (C_1) connected to a charging circuit, an electronic switch (I) controlling discharing of said capacitor (C_1) into the primary winding of the ignition coil, said electronic switch being controlled from the tripping device by a control circuit (**13, 14, 15**) having means (**15**) for successively opening and closing said switch several times in each control position of said tripping device, and time delay circuit means (R_1, C_1, R_2, C_2) for preventing operation of the control circuit when the device is switched on while the tripping device is in a given position, said preventing means being ineffective when the tripping device has moved from said given position, said tripping device comprising a contact-breaker, said time delay circuit means comprising a resitor (R_5) connected in a circuit in series between a point (A) under the voltage of the device and a mobile contact of the contact-breaker, and means (**13**) sensitive to the voltage of the mobile

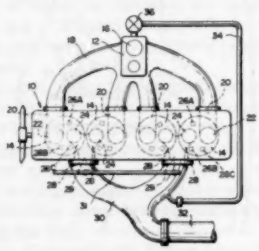
contact of the contact-breaker or to the current passing through said resistor, said time delay circuit means further comprising a bistable trigger (13) controlled from the voltage of the mobile contact of the contact-breaker, and a delay device (R_1, C_1, R_2, C_2) for controlling voltage to the contact-breaker and trigger, said trigger being arranged to remain in a given state corresponding to non-operation of the ignition while the voltage of the mobile contact is increasing slower than the supply voltage of said trigger, said supply voltage being obtained from the voltage of a capacitor (C_1) forming part of a first RC element (R_1, C_1), the voltage applied to the mobile contact of the contact-breaker being derived from the voltage of said capacitor (C_1) and delivered to said contact by a second RC element (R_2, C_2) whose time constant is greater than that of the first RC element.

4,133,330

MULTI-POINT SPARK IGNITION ENGINE PROVIDED WITH EXHAUST RECIRCULATION CIRCUIT

Yasuo Nakajima, Yokosuka; Yoshimasa Hayashi, Yokohama, and Tooru Yoshimura, Yokosuka, all of Japan, assignors to Nissan Motor Company, Ltd., Japan

Filed Mar. 10, 1977, Ser. No. 776,486
Claims priority, application Japan, Mar. 11, 1976, 51-26316
Int. Cl.² F02P *1/00*
U.S. Cl. 123—148 C **12 Claims**



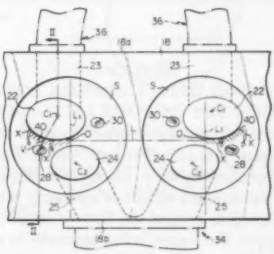
1. An engine system comprising:
an internal combustion engine of the reciprocating piston type having an intake valve and an exhaust valve for each combustion chamber thereof;
an air-fuel proportioning means for supplying a combustible mixture of air and a hydrocarbon fuel to said engine;
an exhaust recirculation means for recirculating a portion of the exhaust gas from the exhaust line of said engine to each combustion chamber together with said combustible mixture at a controlled volumetric flow rate relative to the volume of air admitted into each combustion chamber;
a thermal reactor provided in said exhaust line to oxidize carbon monoxide and unburned hydorcarbons contained in the exhaust gas from said engine;
means for supplying secondary air to said oxidation means; and
at least two spark plugs which produce sparks substantially simultaneously for each combustion chamber;
said intake and exhaust valves being constructed and arranged such that a substantial overlap of the opening periods of said exhaust valve and said intake valve takes place, so that a substantial portion of the combustion gas is left unexhausted from each combustion chamber;
said combustion chamber being defined between the top face of the piston and the bottom face of a cylinder head by a surface of revolution on the longitudinal axis of the cylinder bore;
the number of said at least two spark plugs being determined on the basis of a total volume of the recirculated exhaust gas and the unexhausted combustion gas relative to the volume of air supplied to each combustion chamber, said number being two when said total volume is about 50% of the volume of said air at the maximum and three when said total volume is about 60% at the maximum;
the spark gaps of said at least two spark plugs being arranged distant from each other in each combustion chamber such that, when the entire area of each combustion chamber in plain view is divided into a plurality of sectors which are in the same number as said at least two spark plugs and of approximately the same area, each of said sectors contains one of said spark gaps.

4,133,331

DUAL SPARK-PLUG IGNITION INTERNAL COMBUSTION ENGINE WITH IMPROVED COMBUSTION CHAMBER WALL

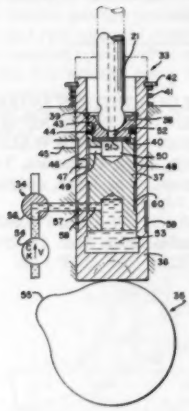
Kizuku Otsubo, Kokubunji; Tooru Yoshimura, Yokosuka, and Akihiro Ohnishi, Kitamoto, all of Japan, assignors to Nissan Motor Company, Ltd., Japan

Filed Mar. 10, 1977, Ser. No. 776,483
Claims priority, application Japan, Mar. 11, 1976, 51-26856
Int. Cl.² F02M *7/00*; F02P *1/00*
U.S. Cl. 123—148 C **11 Claims**



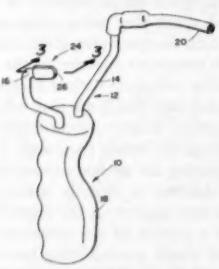
1. An induction combustion engine consisting:
a cylinder head secured to a cylinder block in which a cylinder is formed, said cylinder head being formed with a concavity of which surface closes one end of the cylinder and defines thereinside a combustion chamber which is communicable with an intake port formed in said cylinder head, an air-fuel mixture being provided through said intake port and following a predetermined path through said combustion chamber;
means for providing exhaust gases into the combustion chamber;
an annular intake valve seat on which an intake valve head is seatable, said annular intake valve seat being secured to said cylinder head and formed with an annular flat surface which is exposed to the combustion chamber, the combustion chamber being communicable with an intake port through the opening formed through said annular intake valve seat;
first and second spark plugs disposed in the combustion chamber, each spark plug being composed of a threaded portion by which the spark plug is secured to said cylinder head, and two electrodes mounted on the tip surface of the threaded portion which tip surface is exposed to the combustion chamber, said first spark plug being located on the path of the air-fuel mixture inducted into the combustion chamber through the intake port; and
means for preventing the air-fuel mixture inducted into the combustion chamber to directly strike against the electrodes of said first spark plug, the preventing means being formed with a portion of the concavity surface of said cylinder head which portion lying between said annular intake valve seat and said first spark plug; said air-fuel mixture flow being first directed towards said first spark plug and subsequently towards said second spark plug.

4,133,332
VALVE CONTROL MECHANISM
Carl F. Benson, Torrington, and Harold W. Humphrey, Jr., Harwinton, both of Conn., assignors to The Torrington Company, Torrington, Conn.
Filed Oct. 13, 1977, Ser. No. 841,682
Int. Cl.[2] F02D *13/06*
U.S. Cl. 123—198 F **2 Claims**



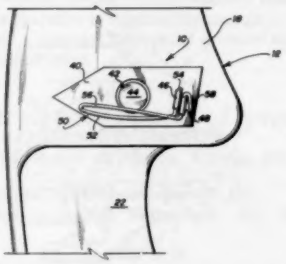
1. In an internal combustion engine having a cylinder head and a reciprocally journalled poppet valve, and means for operating said poppet valve: a collapsible tappet, a control valve, a check valve, and a source of hydraulic oil, the control valve being adapted to control the flow of oil from the source of oil to the tappet, the tappet being normally in contact with the cam of the internal combustion engine so as to be reciprocated by said cam, the tappet including a movable member normally in contact with said cam, and means in contact with said means for operating the poppet valve, said tappet adapted to receive oil from said control valve and to flow oil to said control valve, the flow of oil to the tappet through the check valve serving to keep the movable member in contact with the cam, the flow of oil from the tappet to the control valve causing the movable member of the tappet to be moved to a position whereby the poppet valve, means for operating the poppet valve, and the tappet are deactivated.

4,133,333
SLING SHOT
George A. Janssen, P.O. Box 386, Graton, Calif. 95444
Filed Jul. 5, 1977, Ser. No. 812,753
Int. Cl.[2] F41B *7/00*
U.S. Cl. 124—20 R **8 Claims**



5. In a slingshot comprising:
a handle;
a forked metal rod carried on said handle to extend upwardly therefrom;
tip portions of said forked rod extending in a rearward direction; and
elastic tubing with ends thereof stretched over said fork tip portions;
the improvement comprising;
caps of a resilient material having cold flow characteristics carried over said fork tip portions within said tubing ends;
at least one pair of grooves across said tip portions on opposite sides thereof; and
complementary ridges in said caps;
said tubing ends applying constrictive forces around said caps.

4,133,334
FLIPPER TYPE ARROW REST
Richard D. Tone, 705 N. Pineda, Jacksonville, Tex. 75766
Filed Feb. 1, 1977, Ser. No. 764,637
Int. Cl.[2] F41D *9/00*
U.S. Cl. 124—41 A **11 Claims**

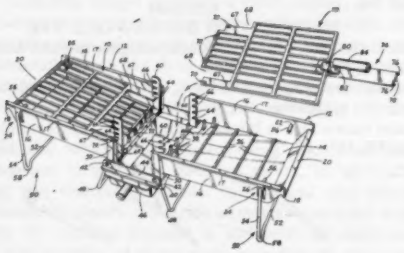


7. An arrow supporting device for use with an archery bow and arrows having stabilizing structure attached to the rear portion of the arrows, the arrow supporting device comprising:
a mounting plate adapted to be affixed to an bow;
a closed loop spring means having first and second arm members being independently compressible and expandable and having first and second ends extending from said arm members;
means for pivotally attaching said closed loop spring means to said mounting plate including first and second pivot members rigidly affixed to said mounting plate for receiving said closed loop spring means ends such that said closed loop spring means ends are rotatable in said pivot members, said first and second arm members lying at a predetermined angular spaced apart relationship to one another and being capable of being vertically flexed for vertical positioning and cushioning of an arrow against said mounting plate;
said arm members being bent relative to the ends of said spring mechanism such that said closed loop spring means is biased laterally outwardly of said mounting plate into an arrow receiving and supporting position to support an arrow at a predetermined angular spaced relationship horizontal to the archery bow as the arrow is readied for release; and
said arms being pivotable about said ends said closed loop spring means being movable towards said mounting plate as an arrow is released to thereby permit an arrow stabilizing structure to clear an arrow supporting device as an arrow traverses an archery bow to minimize deflection of an arrow in flight.

4,133,335
FOLDING TRAY PORTABLE COOKING UNIT

Dannie O. Malafouris, Portland, Oreg., assignor to Barbecue Time, Inc., Portland, Oreg.

Filed Nov. 22, 1976, Ser. No. 743,848
Int. Cl.[2] F24C 1/16; A47J 37/00; F24B 3/00
U.S. Cl. 126—9 R 2 Claims



1. A portable cooking unit for use with charcoal or similar fuel comprising in combination:

(a) a frame,

(b) dished fuel trays pivotally joined to the frame and positionable between a raised substantially vertical lighting position in which the fuel trays are located adjacent one another and a lowered substantially horizontal cooking position, said fuel trays having bores passing through their upper ends,

(c) the fuel trays having flue openings formed in their upper ends allowing air passage therethrough when the fuel trays are in their raised position,

(d) grill support means located within the dished fuel trays,

(e) perforate grills having inner portions removably positionable in the grill support means in a manner to provide a fuel retention space between each tray and grill for receiving the fuel,

(f) generally C-shaped bails having inwardly facing extensions in alignment with each other and arranged for being received pivotally within the bores in the fuel trays in a manner such that the bails are positionable between carrying positions, substantially parallel to the fuel trays for carrying the cooking unit when the fuel trays are in their raised positions, and support positions, substantially normal to the fuel trays for supporting the fuel trays when the fuel trays are in their lowered positions, said aligned extensions passing through said bores and extending into the fuel trays so that said extensions support the outer portions of the grills when the grills are positioned in the grill support means.

4,133,336
VENTILATED STOVE

Alva T. Smith, Rte. 6, Box 21, Hendersonville, N.C. 28739

Filed Sep. 29, 1977, Ser. No. 837,895
Int. Cl.[2] F24C 15/32
U.S. Cl. 126—21 A 6 Claims

1. A stove for use in a recreation vehicle and the like comprising:

an oven having side walls, a front access door and a rear wall;

a rear access door providing access to said oven from outside of said vehicle;

a gas operated burner carried in said oven;

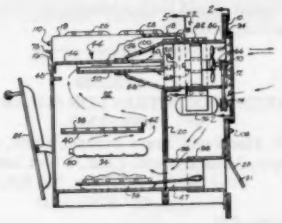
a first cooking compartment disposed above said gas burner;

a second cooking compartment disposed below said gas burner;

a reversible blower communicating with said oven;

means for selectively rotating said blower in a first direction for causing air to flow through said second cooking compartment up past said gas burner into said first cooking compartment; and

means for selectively rotating said blower in a second direction causing air to flow through said first cooking compartment down past said gas burner into said lower second cooking compartment;

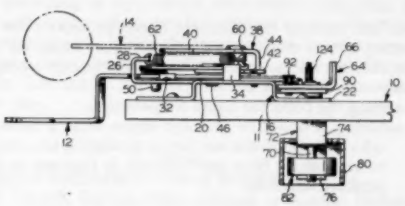


whereby food can be inserted into said lower cooking compartment from outside said vehicle and said blower can be rotated in a direction to force air over said burner for being heated and onto and around said food for cooking said food.

4,133,337
OVEN LATCH ASSEMBLY WITH IMPROVED HIGH TEMPERATURE LOCKING SUB-ASSEMBLY

Christopher J. Shea, New Britain, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Sep. 14, 1977, Ser. No. 833,235
Int. Cl.[2] F24C 15/02
U.S. Cl. 126—197 7 Claims



1. A latch for ovens and the like comprising:

A. a support;

B. a latch subassembly movable on said support between latching and unlatching positions;

C. a high temperature locking pawl having an abutment surface thereon engagable with said latch subassembly to block it movement from latching to unlatching position;

D. means rotatably mounting said pawl on said support;

E. a thermal element operatively connected to said locking pawl and responsive to elevated temperatures to rotate said pawl from a first position wherein said abutment surface is removed from the path of movement of said latch subassembly from latching position to unlatching position to a second position wherein said abutment surface is disposed in said path of movement of said latch subassembly to block its movement into unlatching position, said thermal element being responsive to subsequent decline in temperature to move said pawl from said second position to said first position; and

F. resiliently deflectable means on said locking pawl spaced from the axis of rotation thereof to the opposite side from said abutment surface, said latch subassembly having a surface thereon engagable with said deflectable means as said locking pawl approaches said second position and when said latch subassembly is moved towards unlatching

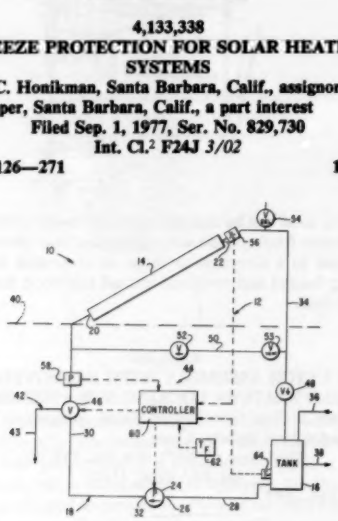
position, said engagement of said surface and said deflectable means effecting rotation of said pawl about its axis of rotation to dispose said abutment surface in said second position and thereby prevent further movement of said latch subassembly into unlatching position, said deflectable means being deflectable by said latch subassembly at conditions of lower temperature so as to permit free movement of said latch subassembly between latching and unlatching positions.

4,133,338

FREEZE PROTECTION FOR SOLAR HEATING SYSTEMS

Terence C. Honikman, Santa Barbara, Calif., assignor to Allen K. Cooper, Santa Barbara, Calif., a part interest

Filed Sep. 1, 1977, Ser. No. 829,730
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 **17 Claims**



1. The method of redundant freeze protection for a solar heating system containing a heat transport liquid for circulation through a solar collector and a solar energy storage tank, comprising the steps of:

sensing the collector liquid temperature,

actuating a collector drainage means from a normal state which accomodates said liquid circulation to a dump state to drain liquid from said collector in response to the temperature condition

$$T_c \leqq T_f$$

where T_c equals the collector liquid temperature and T_f equals a selected freeze protection trigger temperature above the liquid freezing point,

sensing the state of said drainage means, and

terminating liquid circulation through said collector in response to said temperature condition when said drainage means occupies said dump state and continuing liquid circulation through said collector and tank in response to said temperature condition when said drainage means occupy said normal state.

7. In a solar heating system including a solar collector, a solar energy storage tank, and circulating means having off and on states and operable in said on state to circulate a heat transport liquid through said collector and tank, a redundant freeze protection system comprising:

collector drainage means having normal and dump states and operable in said normal state to permit liquid circulation through said collector and tank by circulating means and in said dump state to drain liquid from said collector, and

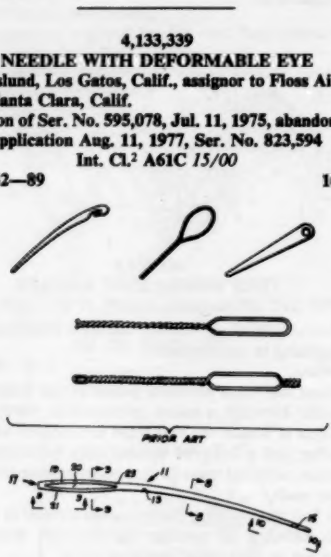
control means responsive to the collector liquid temperature T_c to a selected freeze protection trigger temperature T_f greater than the liquid freezing temperature, and to the current state of said collector drainage means for (a) actuating said drainage means to its normal state when $T_c > T_f$ and to its dump state when $T_c \leqq T_f$, (b) actuating said liquid circulating means to its on state when $T_c > T_f$ or when $T_c < T_f$ and said drainage means occupies its normal state, and (c) actuating said liquid circulating means to its off state when $T_c < T_f$ and said drainage means occupies its dump state.

4,133,339

NEEDLE WITH DEFORMABLE EYE

Erik I. Naslund, Los Gatos, Calif., assignor to Floss Aid Corporation, Santa Clara, Calif.

Continuation of Ser. No. 595,078, Jul. 11, 1975, abandoned. This application Aug. 11, 1977, Ser. No. 823,594
Int. Cl.² A61C 15/00
U.S. Cl. 132—89 **16 Claims**



1. A needle for leading dental floss and the like through narrow apertures comprising,

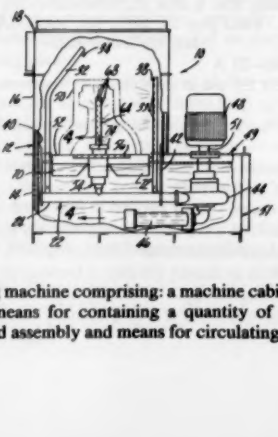
a semi-rigid needle body having a rearward end defining an elongated eye between opposed resilient, deformable sides for temporary expansion and compression of the eye, said eye having a fixed forward and rearward radius between said opposed deformable sides, the combined maximum width of both of said deformable sides is less than twice the maximum width of the needle body apart from said eye.

4,133,340

CLEANING MACHINE FOR SIMULTANEOUSLY CLEANING THE INTERIOR AND EXTERIOR OF HOLLOW ARTICLES

Thomas B. Ballard, 25550 Mulberry Dr., Southfield, Mich. 48075

Filed Apr. 18, 1977, Ser. No. 788,295
Int. Cl.² B08B 3/02, 9/08
U.S. Cl. 134—112 **12 Claims**



1. A cleaning machine comprising: a machine cabinet including reservoir means for containing a quantity of a cleaning fluid; a manifold assembly and means for circulating a cleaning

fluid into said manifold assembly; a plurality of spray pipes in fluid communication with said manifold assembly and adapted to receive cleaning fluid therefrom under pressure; said plurality of spray pipes including at least two spray pipes; a rotary table rotatably supported on one of said at least two spray pipes, said one spray pipe centrally located in said cabinet and extending vertically, said manifold assembly including a horizontally extending central distribution fluid conduit, and further including means providing a fluid coupling between said one spray pipe upon which said rotary table is supported and said horizontally extending fluid conduit; means for rotating said table on said one spray pipe, including rotary bearing means, carried by said fluid coupling; a downwardly directed sleeve received over the outside diameter of said rotary bearing means, said rotary bearing means being secured on their inside diameter to said fluid coupling means; an upwardly extending cup element positioned to surround said downwardly extending sleeve to provide a lubricant reservoir with a quantity of lubricant disposed in said lubricant reservoir; each of said plurality of spray pipes including jet openings adapted to direct a spray of cleaning fluid onto surfaces of an article disposed on said rotary table; whereby said part may be cleaned by a circulation of the cleaning fluid through said manifold assembly into said plurality of spray pipes and sprayed through said jet openings.

4,133,341

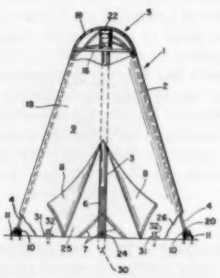
TENT CANOPY SUPPORTED BY A PLATE AND SPRING WOUND STRAND

Virginia Shaheen, 5 Junction Rd., North Reading, Mass. 01864

Continuation-in-part of Ser. No. 779,351, Mar. 21, 1977, abandoned. This application Mar. 13, 1978, Ser. No. 885,494

Int. Cl.[2] A45F *1/16*

U.S. Cl. 135—1 D **10 Claims**



1. A portable, quickly assembled and disassembled tent comprising:

a. canopy of limp fabric having a closed upper end;

b. a tent pole having a horizontal plate and a vertical wire housing fixed to the upper end thereof, said plate and housing supporting the closed upper end of said canopy;

c. at least three spools of flexible line each rotatable in a horizontal plane on a common vertical axis within said housing, each line having a free terminal end withdrawable from said housing;

means for anchoring the said free terminal end of each flexible line to the ground at a spaced distance from the bottom of said pole, when said lines are unwound from said spools;

said pole, plate and wire housing and extended wires comprising means to support said canopy to form an enclosed space.

4,133,342

METHOD OF REPLACING SEALS IN A WELL RAM TYPE BLOW OUT PREVENTER

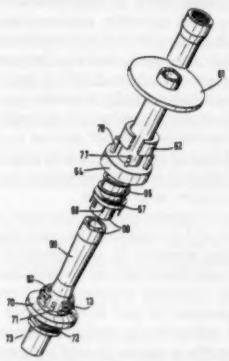
David A. Carnahan, Garricks House, Hampton Court Rd., Hampton, Middlesex, England

Division of Ser. No. 536,312, Dec. 26, 1974, Pat. No. 4,003,430. This application Nov. 2, 1976, Ser. No. 738,060

Claims priority, application United Kingdom, Jan. 2, 1974, 00134/74

Int. Cl.[2] B23P *7/00*

U.S. Cl. 137—15 **17 Claims**



1. In a method of replacing a seal in a ram type blow out preventer at the lower end of a well riser which comprises the steps of removing a seal from a first blow out preventer ram in situ at the lower end of the well riser, and inserting a replacement seal within the seal recess of the first ram, the improvement of providing a replacement shoe which comprises a recessed part annular member to fit in the seal recess of the first ram and a seal secured within the recess of said recessed member, whereby the replacement seal may have an internal diameter smaller than that of the seal removed from the blow out preventer ram.

4,133,343

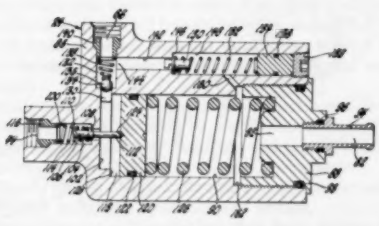
VALVE ASSEMBLY FOR A BRAKE SYSTEM

Luther E. Carroll, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 15, 1976, Ser. No. 732,765

Int. Cl.[2] F16K *45/02*

U.S. Cl. 137—116.5 **2 Claims**



1. A pressure regulator assembly for providing an outlet pressure within a pressure range defining a substantially constant pressure level relative to a widely variable inlet pressure range, pressure relief for the outlet pressure to limit outlet pressure increase, and for preventing outlet pressure decrease below a set pressure less than the substantially constant pressure level range subject to a minimum inlet pressure at least as great as said substantially constant pressure level range, said assembly comprising:

a housing having a pressure inlet, a pressure outlet, a relief outlet, and a chamber fluidly connected to said pressure inlet and said pressure outlet;

a pressure responsive movable member in said chamber and dividing said chamber into first and second chamber sections and forming one wall of each of said chamber sections and adapted to move to increase the volume of said first chamber section when the pressure therein tends to exceed said substantially constant pressure level range, and to move to decrease the volume of said first chamber section when the pressure therein returns to said substantially constant pressure level range;

a pressure limiting valve in said pressure inlet operatively engaged by said movable member to close when said movable member moves to increase the volume of said first chamber section beyond a point corresponding to the existence of pressure in said first chamber section tending to exceed said substantially constant pressure level range, and operatively engaged by said movable member to open when said movable member moves to decrease the volume of said first chamber section in response to pressure in said first chamber section returning to said substantially constant pressure level range;

a check valve positioned fluidly between said first chamber section and said pressure outlet, said check valve closing and retaining pressure in said pressure outlet when the pressure in said first chamber section decreases below said substantially constant pressure level range and opening when the pressure in said first chamber section is at least within said substantially constant pressure level range and greater than the pressure in said pressure outlet;

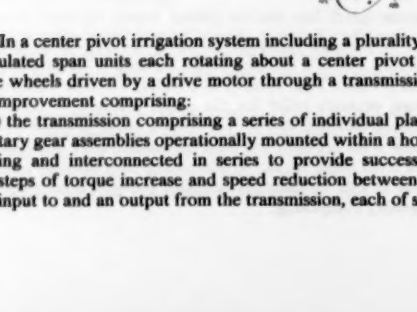
said relief outlet being in constant fluid communication with said second chamber section and a pressure relief valve in said relief outlet and connected to said pressure outlet fluidly downstream of said check valve and fluidly between said check valve and said second chamber section, said pressure relief valve being responsive to a set pressure greater than said substantially constant pressure level range to limit pressure in said pressure outlet to a maximum equal to said set pressure.

4,133,344

POWER TRANSMISSION FOR SELF-PROPELLED IRRIGATION SYSTEM

Edwin J. Hunter, Rancho Santa Fe, and Richard E. Hunter, Carlsbad, both of Calif., assignors to The Toro Company, San Marcos, Calif.

Filed Jun. 10, 1976, Ser. No. 694,904
Int. Cl.[2] B05B *3/00*
U.S. Cl. 137—344 **1 Claim**



1. In a center pivot irrigation system including a plurality of articulated span units each rotating about a center pivot on drive wheels driven by a drive motor through a transmission, the improvement comprising:

(a) the transmission comprising a series of individual planetary gear assemblies operationally mounted within a housing and interconnected in series to provide successive steps of torque increase and speed reduction between an input to and an output from the transmission, each of said planetary gear assemblies comprising planet gears of a self-lubricating thermoplastic material mounted on a planetary carrier with an associated sun gear, said planet gears of at least all said assemblies after the first of said series each comprising a plurality of gear segments rotatably mounted on a common shaft carried by said connector whereby the operational loading forces imposed on each of said segmented planet gears is equally proportionally distributed to each of said gear segments, said planet gears of each of said series of assemblies being comprised of a greater number of said segments than the next preceding of said assemblies of said series and all said segments being of substantially the same thickness whereby said planet gears of each of said series of assemblies are provided with an increased surface area as compared to the next preceding of said assemblies of said series; and,

(b) means for absorbing misalignment stresses disposed between said input of the transmission and the first of said series of assemblies comprising:

(1) a worm driven by said input of the transmission; and,

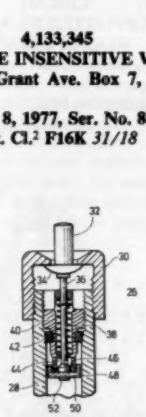
(2) a helical gear driven by said worm and connected to drive the first of said series of assemblies.

4,133,345

ATTITUDE INSENSITIVE VALVE

Clarence Mitchell, 17 Grant Ave. Box 7, Lakefield, Ontario, Canada (K0L-2H0)

Filed Jun. 8, 1977, Ser. No. 804,797
Int. Cl.[2] F16K *31/18*
U.S. Cl. 137—446 **7 Claims**



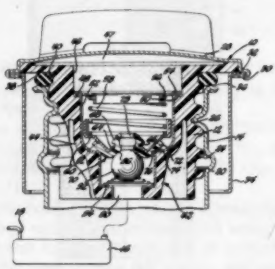
1. An attitude insensitive liquid release valve having an elongated body with an inlet at one end and an outlet at the opposite end, a valve seat within the body, stem mounted closure means, spring means biassing said closure means axially into sealing relation with said valve seat, said stem terminating within said body adjacent the outlet end, an outlet cap threadedly secured to said outlet end having an aperture therein to provide access to said body, an actuator spindle extending through said cap having a radial clearance therefrom to permit canting displacement of the spindle relative to the cap, spindle head means having a diameter greater than said cap aperture to produce axial inward displacement of the spindle upon canting of the spindle and stem contact means on said spindle head means to directly contact said stem in axial displacing relation therewith to permit flow of liquid through the valve.

3. The valve as claimed in claim 1 including float means securing to the end of said spindle remote from said valve body.

4,133,346
PRESSURE VACUUM RELIEF VALVE

Claude A. Smith, Huron, and Donald L. Williams, Port Clinton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 6, 1977, Ser. No. 804,141
Int. Cl.[2] B65D *51/16*
U.S. Cl. 137—493.6 5 Claims

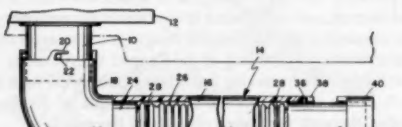


1. A pressure vacuum relief gas cap including a closure for sealing between a first source of pressure and a second source of pressure, a valve housing on said closure having a bore therethrough, wall means in said housing including a fixed valve seat forming an opening between said first and second sources of pressure, a seal element having an apex and a skirt of conical configuration, means including a movable carrier connected to said apex and a compression spring located coaxially of said seal element and against said carrier for supporting said skirt coaxially of said opening for engagement with said fixed valve seat to seal said opening against flow therethrough, said compression spring being responsive to a predetermined pressure differential between said first and second sources of pressure to cause said skirt to open to produce an annular open flow area between said fixed valve seat and said skirt, said compression spring being responsive to a reversal of pressure differential between said first and second pressure sources to close said skirt against said fixed valve seat to wipe the surface of said skirt, and relief valve means to open communication between said first and second sources of pressure when vacuum occurs in said second source, said seal element including a vacuum opening therethrough and further including a reversely bent segment forming a conical vacuum seal surface, said relief valve means including a ball check valve sealing said vacuum seal surface to control flow through said vacuum opening in response to vacuum in said second source.

4,133,347
WASTE EVACUATION ATTACHMENT FOR RECREATIONAL VEHICLES

Albert Mercer, P.O. Box 446, Franklin, Mass. 02038

Filed Oct. 31, 1977, Ser. No. 847,122
Int. Cl.[2] F16K *27/12*; F16L *3/00*
U.S. Cl. 137—344 6 Claims



1. A waste evacuation attachment for a recreational vehicle having a stub pipe waste outlet, said attachment comprising:

(a) a rigid cylindrical housing having means to connect one end thereof rigidly to said stub pipe in communication therewith, whereby said housing when so connected defines an integral, immobile extension of said stub pipe;

(b) an axially expandable hose mounted in said housing and having a fixed end connected to said one end of said housing and having a free end extendable externally of said housing;

(c) Said hose being of length when expanded which is large compared to the length of said housing to permit the free end of said hose to reach a stationary sewage receiving tank, and the compressed length of said hose being such that said hose is completely contained in said housing when compressed;

(d) an end piece element mounted on the free end of said hose and being adapted to connect to the inlet of a stationary sewage receiving tank to define a continuous waste flow passageway from said waste containment facility through said housing and hose into said stationary sewage receiving tank;

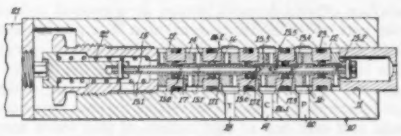
(e) a cap element and means to mount same in sealed relation to said end piece element when said attachment is not in use; and

(f) said and piece element having means to engage same to said housing when the attachment is not in use to define a compact, self-contained sealed unit completely containing said hose.

4,133,348
SOLENOID OPERATED VALVES

Russell W. Spitz, 6802 Tanglewood Dr., Boardman, Ohio 44512

Filed Mar. 30, 1977, Ser. No. 782,769
Int. Cl.[2] F16K *31/02*
U.S. Cl. 137—625.65 1 Claim



1. In a reciprocating control valve having:

a valve body provided with an elongated bore therein and a plurality of spaced ports therealong intersecting said bore,

an elongated plunger reciprocably received within said bore, said plunger including spaced hollow portions therewithin having radial ports extending therefrom for controlling flow of fluid between said valve body ports,

an electric solenoid of commercially available manufacture cooperatively associated with said plunger for effecting lifting movement thereof in controlling fluid flow, and,

a plurality of seals carried by said body encircling said bore and in sealing contact with said plunger to prevent fluid flow through said bore other than through said ported plunger;

the improvement therein to reduce to a minimum the required breakaway pressure to initiate movement of said plunger from a stationary condition and require minimum pressure in axially shifting the same, comprising:

said plunger having a buffed, chrome-plated exterior surface to provide maximum smoothness of surface,

said plunger having a diameter less than three-eighths of an inch ($\frac{3}{8}$") thereby to minimize the total surface area subject to sliding friction,

said seals being formed from extremely low-friction material such as polytetrafluoroethylene, and

said seals further having a generally C-shaped cross-section and opening axially of the valve body, with said seals having curved lips thereby to dispose a single lip of said seal in substantially line contact with said plunger and thereby as a valve port of said plunger passes thereunder, fluid in said plunger exerts pressure outwardly against said

lip flexing the same to eliminate frictional contact therewith,

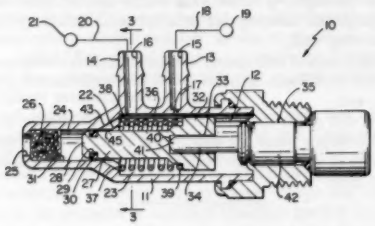
whereby friction throughout said valve body and valve plunger contact zones are maximally reduced for easy operation of the valve.

4,133,349

CONDITION RESPONSIVE BY-PASS VALVE CONSTRUCTION AND METHOD OF MAKING THE SAME

Stephen J. Stripling, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed May 25, 1977, Ser. No. 800,300
Int. Cl.[2] G05D *16/00*
U.S. Cl. 137—882 **10 Claims**



1. In a condition responsive by-pass valve construction having a housing means provided with an inlet and two outlets interconnected to said inlet, said housing means having a valve seat means disposed between one of said outlets and said inlet, said valve seat means comprising a first cylindrical chamber part of said housing means interconnected by an annular angled surface of said housing means to a second cylindrical chamber part of the housing means that is larger in diameter than said first chamber part, said housing means carrying a movable valve member means for controlling the flow of fluid through said valve seat means to said one of said outlets to provide substantially a linear percentage by-pass flow between said inlet and said one of said outlets as said valve member means moves between a fully opened position thereof and a fully closed position thereof where said valve member means is sealing disposed in said first chamber part, said housing means carrying a condition responsive means for controlling movement of said valve member means, the improvement wherein said annular angled surface of said valve seat means has groove means therein extending between said first chamber part and said second chamber part and intersecting therewith for said valve member means to be progressively bridging and unbridging to provide said substantially linear percentage by-pass flow.

4,133,350

TAMPER-RESISTANT FLOW CONTROL ATTACHMENT FOR SHOWER ARM

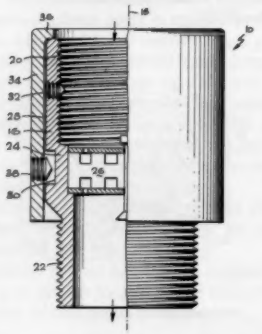
Walter R. Nelson, 7914 Grand Ave., Yucca Valley, Calif. 92284

Filed Mar. 7, 1977, Ser. No. 775,102
Int. Cl.[2] F16L *15/00*
U.S. Cl. 138—44 **2 Claims**

1. A tamper-resistant flow control attachment for a shower arm comprising:

a generally tubular housing including a longitudinal, central axis, an outer, generally cylindrical surface, an inlet end, an internally threaded inlet portion adapted to be secured to the discharge end of a shower arm, and an outlet portion having external threads adapted to be secured to the inlet of a shower head, a central portion between the inlet and outlet portions carrying means for controlling the volumetric flow rate through the attachment, an annular groove in the outer surface disposed between the inlet and outlet portions and a first radially oriented set screw requiring a special wrench for installation and removal for securing the housing to the shower arm against rotation relative thereto; and

an outer tubular shell, concentric with and enclosing the inlet and central portions of the housing, one end of the



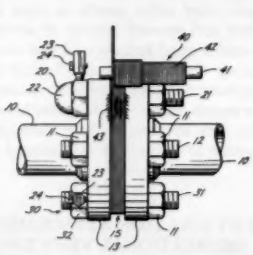
shell extending beyond the annular groove so as to completely cover the groove and including a second radially oriented set screw requiring a special removal installation tool and extending into the groove to limit axial movement of the shell, the shell being freely rotatable relative to the housing.

4,133,351

METHOD AND APPARATUS FOR SEALING A PIPELINE LEAK

George W. Harrison, Houston, and Billie G. Moore, Alvin, both of Tex., assignors to Team, Inc., Alvin, Tex.

Division of Ser. No. 677,864, Apr. 16, 1976, Pat. No. 4,073,836.
This application Jan. 28, 1977, Ser. No. 763,632
Int. Cl.[2] F16L *55/16, 55/18*
U.S. Cl. 138—97 **1 Claim**



1. An assembly for repair of leaks in flanged connections wherein a gap exists between flange pieces forming the connections, comprising:

(a) a plurality of bolts at least one of which has a slot in one end thereof, said bolts being spaced about the periphery of the connection to connect the flange pieces to each other and extending in the gap of the flanged connections;

(b) each of said bolts having a slot being positioned such that each of the slots extends from outside one of the flange pieces, through the flange piece, into the gap;

(c) nut means for securing said bolts to said flanged connections;

(d) at least one of said nut means secured to one of each of said bolts having a slot including an injection passage therethrough wherein securing each of said at least one nut means on an associated bolt enables communication of the passage with the slot in said bolt;

(e) injection valve means for mounting in communication with the passage of said at least one of the nut means;

(f) wrapping means for wrapping an elongated flexible member around the bolts in said gap a plurality of times to enclose the gap between the flange pieces in continuous layers for enabling sealant injected through the injection valve to be placed under the wrapped flexible member for repairing the flanged connection.

4,133,352

PIPE COATING COMPOSITIONS

Russell E. Koons, El Dorado, Ark., assignor to Lion Oil Company, Los Angeles, Calif.

Continuation of Ser. No. 633,125, Nov. 18, 1975, abandoned. This application Oct. 21, 1977, Ser. No. 844,287

Int. Cl.² F16L *9/02;* C08L *15/02;* B05D *1/36;* B32B *15/04*

U.S. Cl. 138—146 **26 Claims**

1. An article coated with a primer composition and an asphaltic coating, said primer composition being present in an amount sufficient to impart resistance to cathodic disbonding of said asphaltic coating from said article, said primer composition comprising chlorinated rubber, a 20% solution of the chlorinated rubber in toluene having a viscosity of from about 20 to about 300 centipoises at 25° C., and an aromatic petroleum pitch having a softening point of from about 104° F. to about 152° F. and a specific gravity at 60° F. of about 1.17, the weight ratio of chlorinated rubber to aromatic petroleum pitch being from about 0.8 to 1 to about 2 to 1.

7. A primer composition for imparting resistance to cathodic disbonding of an asphaltic coating from an article coated therewith, said primer composition consisting essentially of at least one chlorinated rubber, a 20% solution of said chlorinated rubber in toluene having a viscosity of from about 20 to about 300 centipoises at 25° C, and at least one aromatic petroleum pitch, the components of the aromatic petroleum pitch being substantially aromatic and being obtained by heat cracking at at least 700° C a member selected from the group consisting of crude petroleum oil, heavy oil, naphtha, asphalt, and mixtures thereof, and distilling off the cracked fractions of 400° C and less, said chlorinated rubber and aromatic petroleum pitch being dissolved in at least one solvent therefor, the weight ratio of chlorinated rubber to aromatic petroleum pitch being at least about 0.8:1.

4,133,353

PNEUMATIC WEAVING MACHINE AND WEFT INSERTING DEVICE FOR SUCH A MACHINE

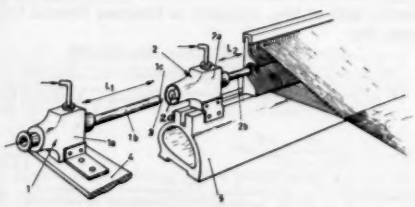
Adrianus J. F. Larmit, Moergestel, Netherlands, assignor to Ruti-Te Strake B. V., Deurne, Netherlands

Filed Sep. 19, 1977, Ser. No. 834,706

Claims priority, application Netherlands, Sep. 17, 1976, 7610385

Int. Cl.² D03D *47/30*

U.S. Cl. 139—435 **4 Claims**



1. A pneumatic weaving machine having air fed apparatus for inserting a weft into a weaving shed and which includes a main blowing nozzle and at least one auxiliary blowing nozzle, each having a weft inlet and a weft outlet, and being located adjacent to and outside of one end of the shed, the auxiliary blowing nozzle being arranged in series between the weft outlet of the main nozzle and the adjacent end of the shed, there being a free space between said outlet and the weft inlet end of the auxiliary mozzle through which the air stream from the main blowing nozzle laterally escapes.

4,133,354

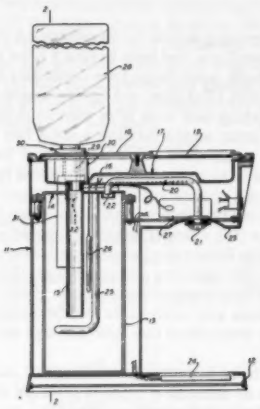
COFFEE BREWER WITH MEANS FOR DISPENSING CONTROLLED QUANTITIES OF HOT WATER

Edward Lerner, 3 Marshall St., Irvington, N.J. 07111, and John A. Ventura, 32 Jefferson St., Nutley, N.J. 07110

Continuation-in-part of Ser. No. 532,366, Dec. 13, 1974. This application Feb. 28, 1977, Ser. No. 772,855

Int. Cl.² B65B *3/04*

U.S. Cl. 141—18 **11 Claims**



1. A coffee brewer with means for dispensing controlled quantities of hot water, comprising:

(a) a first water tank;

(b) water inlet means connected to the first water tank;

(c) a water discharge conduit connected to the first tank; the discharge of water therethrough being responsive to the water level in the first tank;

(d) a second water tank positioned for gravity feed of water therefrom to the said first tank;

(e) conduit means connecting the first and second tanks, the normal operational position of the discharge end of the said conduit means opposite the second tank being located slightly above the top end of the said water discharge conduit such that water normally covers said discharge end before water reaches a level in the first tank sufficient for continuous flow through the top end of said water discharge conduit;

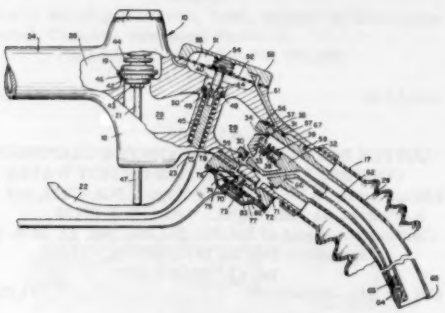
(f) the said second tank being closed except for the said conduit means when in the normal operating position for discharge into the first tank; and

(g) valve-controlled water discharge conduit means connected to the first tank having an entrance in the first tank at a level with respect to the normal operational level of the water therein beneath the level of the said discharge end of the conduit means connecting the first and second tanks.

4,133,355
SEALABLE DISPENSING NOZZLE WITH AUTOMATIC SHUT-OFF

Edward A. Mayer, Newburgh, N.Y., assignor to Texaco Inc., New York, N.Y.

Continuation of Ser. No. 693,572, Jun. 7, 1976, abandoned. This application Dec. 2, 1977, Ser. No. 856,708
Int. Cl.[2] B65B 57/14
U.S. Cl. 141—217 4 Claims



1. In a dispensing nozzle for transferring a volatile fuel from a source thereof to a fuel tank having a filler pipe, said nozzle including a body, a discharge tube depending from the body to register in a tank filler pipe, and having means on said body for sealably engaging said tank filler pipe to define a removable, vapor tight joint, means forming a main fuel flow passage in said body, a main flow valve (19) in said fuel flow passage being adjustable to an open position to allow fuel flow into said fuel tank, and

a main valve (19) actuator, including means forming a closed chamber (51), a diaphragm (52) disposed across said chamber (51) to form a displaceable wall thereof, and a connector (22, 45) engaging said diaphragm (52) with said main valve (19), whereby displacement of said diaphragm (52) will release said main valve (19) from an open position to thereby discontinue fuel flow through said main fuel flow passage,

means forming a constriction (31) across said main fuel flow passage to establish a reduced pressure therein when fuel flows through the constriction (31),

first passage means (61) communicating said constriction (31) with said chamber (51) to apply a reduced pressure against one side of said diaphragm (52) during periods of fuel flow through the nozzle, said reduced pressure being insufficient to substantially displace the diaphragm (52),

a sensing circuit in said nozzle to regulate fuel flow therethrough and including, means forming an elongated sensing passage having a sensing point (64) at the remote end thereof disposed in said discharge tube, and having the sensing passage other end being communicable with said constriction (31), and said first passage means (61),

first and second valve means (73, 94) serially communicated in said means forming said elongated sensing passage, said respective valves being concurrently operable to an open position whereby to communicate said sensing point (64) with said constriction (31) and said first passage means (61),

said first valve (94) including a first valve actuator (102, 111), and second passage means (109) communicating said first actuator (102, 111) with said main fuel flow passage at a point in the latter upstream of said constriction (31), whereby said first valve (94) will be urged into open position only in response to a predetermined minimal fuel pressure at said second passage (109),

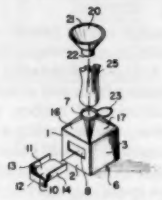
said second valve (73) including a second valve actuator (77, 83) positioned to urge said second valve (73) into open position, whereby said second valve (73) will be urged to a closed position only in response to a predetermined increase in pressure in said sensing passage downstream of said second valve (73)

whereby upon the closing of either of said valves (73, 94) said elongated sensing passage will be closed, thereby allowing said reduced pressure against one side of said diaphragm (52), to become increased a sufficient amount to cause the displacement of the diaphragm, and the subsequent closing of main valve (19) whereby to end fuel flow through the nozzle main fuel flow passage.

4,133,356
BAG FILLING KIT

Julia E. Dillingham, 414 N. Marshall St., Graham, N.C. 27253

Filed Aug. 26, 1977, Ser. No. 827,979
Int. Cl.[2] B65B 39/06
U.S. Cl. 141—316 2 Claims



1. A bag filling kit, comprising

a hollow stand having side walls and spaced opposite first and second open ends, the second end of the stand tapering down to a neck smaller than the first end, said stand being square at its first open end and circular at its second open end and having slots formed in opposite ones of said side walls;

a funnel having side walls and spaced opposite first and second open ends, the side walls tapering down from the first end to the second end, said second end having a neck having dimensions small enough to fit into the neck of the stand, said funnel being independent and separate from said stand;

a flexible collar-like clasp positionable around the open neck of the stand for releasably clasping the neck of a flexible bag to the outside of the open neck of the stand with the remainder of the bag in the stand, the neck of the bag being bent over the outside of the neck of the stand whereby the bag is fillable with material via the funnel when the neck of the funnel is inserted into the open neck of the bag, said clasp being separate and independent from said stand and said funnel; and

a shelf removably insertable into the stand via the slots of the side walls thereof and supported by said side walls.

4,133,357
HAND TOOL REST FOR FORMING CURVED SURFACES

George J. Groya, St. Louis County, and Curtis J. Eccardt, St. Charles, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Jul. 15, 1977, Ser. No. 816,004
Int. Cl.[2] B27C 7/06
U.S. Cl. 142—49 8 Claims

1. In a hand tool rest to facilitate the turning of curved surfaces on a wood lathe, a horizontal tool rest bar comprising

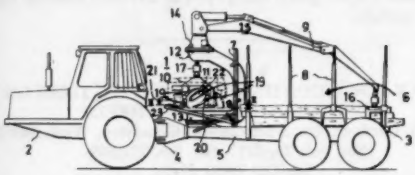
two joined oppositely curving arcuate portions and a cylindrical mounting post positioned between said arcuate portions and extending downward from said rest bar, tool rest mounting means including a carriage slidably adjustable along the ways of a lathe and a tool rest holder mounted for horizontal rotation and translational adjustment on said carriage, said rest holder including a vertical bore therein receiving said mounting post for vertical sliding movement and rotation therein, and releasable means on said rest holder for locking said post in a predetermined vertical and rotative position in said bore.

4,133,358

METHOD OF TREATING TREES AND A MACHINE FOR PRACTICING THE METHOD

Håkan A. L. Stahre, and Dane E. R. Glantz, both of Jönköping, Sweden, assignors to Husqvarna AB, Huskvarna, Sweden

Filed Dec. 7, 1976, Ser. No. 748,205
Claims priority, application Sweden, Dec. 10, 1975, 7513889
Int. Cl.² A01G *23/08*
U.S. Cl. 144—3 D **4 Claims**



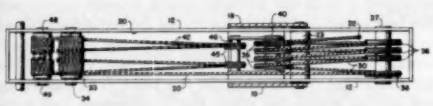
1. A machine for de-branching felled trees and cutting the de-branched trees into logs comprising a wheeled vehicle, a driving and control cabin at one end of the vehicle, means defining a log-loading area at the other end of the vehicle, a frame on the vehicle defining a space between said cabin and said log-loading area, power operated apparatus including tree-feeding means, de-branching means and cutting means carried on said frame within said space, a log collecting structure mounted on the vehicle to one side of said space for receiving cut logs from said cutting means, power operated lifting means on the vehicle for delivering felled trees to said apparatus and for transferring cut logs from said collecting structure to said log-loading area, and a bracket structure on the frame, said apparatus being pivotable and rotatably mounted in the bracket structure.

4,133,359

WOODSPLITTER

Bruce W. Jensen, and David L. Bacon, both of Denver, Colo., assignors to Lawrence E. Livingston and Victoria A. Livingstone, both of Englewood, Colo.

Filed Jan. 21, 1977, Ser. No. 761,089
Int. Cl.² A47J *49/02*
U.S. Cl. 144—193 R **14 Claims**



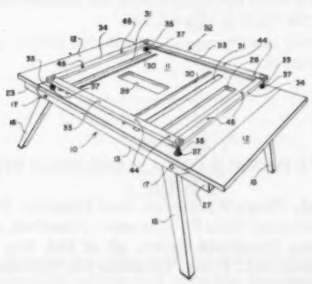
1. A device for splitting wood comprising:
an elongated bed structure in the form of a boxed member enclosed on at least three sides;
a trolley movably mounted mounted on the bed structure;
an abutment;
a splitting blade, one of the abutment and the splitting blade being mounted on the trolley and the other being fixedly mounted relative to the bed;
a prime mover;
first mechanical drive means having a mechanical advantage greater than unity and sufficient to urge the splitting blade through wood with the power available from the prime mover, the first mechanical drive means being mounted between the trolley and the prime mover and connected to the trolley to move the abutment and splitting blade together;
a second mechanical drive means having a mechanical advantage less than that of the first mechanical drive means and also mounted between the prime mover and trolley but adapted to move the abutment and splitting blade apart;
the first and second mechanical drive means each comprising a cable member enclosed by the elongated bed and secured at one end to an associated driven drum within the elongated bed, each cable member engaging at least one intermediate pulley journalled to the trolley and also positioned within the elongated bed, and each cable being fixedly secured at the other end, the intermediate pulleys and driven drums being journalled around substantially parallel axes, and
selective engagement means operably connected to the prime mover and selectively engagable with either the first and the second mechanical drive means;
whereby the first mechanical drive means may be selectively engaged with the prime mover to move the trolley in a manner such that a log disposed on the bed will be split as the abutment and splitting blade move together and, upon splitting of the log, the abutment and slitting blade may be moved apart at a greater rate by selectively engaging the second mechanical drive means.

4,133,360

PORTABLE CIRCULAR POWER HAND SAW BENCH

Anthony Sanfilippo, and Evangelyne L. Sanfilippo, both of 1554 Ramona La., St. Charles, Mo. 63301

Continuation of Ser. No. 648,621, Jan. 12, 1976, abandoned. This application Oct. 20, 1976, Ser. No. 734,240
Int. Cl.² B25H *1/02;* B26D *1/14*
U.S. Cl. 144—286 R **5 Claims**



1. In a work bench for supporting a power tool in operative positions for performing a variety of operations on a workpiece, the improvement which comprises: a workpiece supporting surface, said supporting surface having a first elongated slot opening therethrough and a second elongated slot opening therethrough oriented with its lengthwise dimension at substantially right angles to the lengthwise dimension of said first slot; power tool support frame means formed by opposed side and end members of equal lengths to form a square opening over said support surface with certain of said members of said frame means being parallel to one slot and certain others of said members of said frame means being parallel to the other slot; means attaching said frame to said supporting surface in spaced relation therefrom and in position to encompass said first and second slots; power tool guide means; and means connecting said power tool guide means to said frame means in

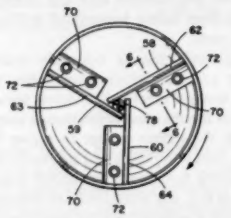
selective positions of alignment with said first and second slots to position the power tool to perform an operation on a workpiece positioned on said supporting surface adjacent the selected position of said power tool guide means, said means connecting said power tool guide means to said frame means being interchangeably supported by said side and end members adjacent one of said slots.

4,133,361

METHOD FOR MACHINING JOINTS FOR MITERS, GROOVES AND OTHER JOINERY IN A BEVELED OR STRAIGHT PANEL EDGE AND APPARATUS FOR SAME

Jaroslav Martinu, Hickory Hills, Ill., assignor to Woodwork Corporation of America, Chicago, Ill.

Filed Feb. 2, 1976, Ser. No. 654,101
Int. Cl.[2] B27C *1/02*
U.S. Cl. 144—323 **7 Claims**



1. An improved method for machining a projected surface of material comprising the steps of:

engaging the material with the cutting edge of a cutting blade, said blade being rotated about an axis intersecting the projected surface, said blade edge extending substantially radially outward from the axis of rotation;

translating the material relative to the blade edge along a path defining the surface whereby the blade edge cuts and shapes the surface by a shearing action of said blade edge upon the material, the angle of shear being constantly varied in a plane perpendicular to the rotation axis of the blade as the blade is rotated; and

simultaneously machining a groove in said surface along the axis of rotation.

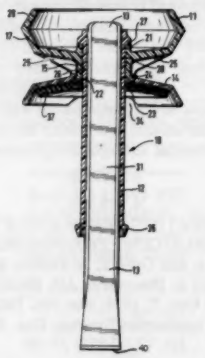
4,133,362

PROTECTIVE HANDLE FOR A HAND-HELD STRIKING TOOL

Hardy Kolloch, Neuss-Weckhoven; Karl-Friedrich Tillmanns, Remscheid-Hasten; Hans W. Tillmanns, Remscheid, and Gunter Tillmanns, Remscheid-Hasten, all of Fed. Rep. of Germany, assignors to C. Friedr. Tillmanns KG, Remscheid, Fed. Rep. of Germany

Filed Dec. 7, 1977, Ser. No. 858,528
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1976, 2657558
Int. Cl.[2] B25D *3/00*
U.S. Cl. 145—24 **17 Claims**

1. A protective handle for a hand-held striking tool having an impact-imparting leading surface and an elongated stem extending in an outward direction from the impart-imparting leading surface, the handle comprising, in combination, an elongated elastic socket grip lying on and defining an axis and fitting over and firmly united with a portion of the elongated stem, said socket grip having two axially spaced ends, one of said ends being closer to and the other of said ends being farther from the impact-imparting leading surface of the tool; a concave guard mounted at said other end of said socket grip and being open in direction away from the leading surface; and a convex guard mounted on said socket grip between said concave guard and said one end and connected to said concave



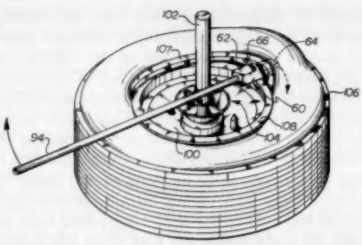
guard, said convex guard being open in direction towards the leading surface.

4,133,363

DEVICE FOR MOUNTING/DEMOUNTING TIRES ON CUSTOM AUTOMOBILE WHEELS

Larry D. Gardner, Rte. 2 Box 2680A, Grandview, Wash. 98930

Filed Feb. 25, 1977, Ser. No. 772,065
Int. Cl.[2] B60C *25/04*
U.S. Cl. 157—1.3 **9 Claims**



1. An article of manufacture useful with a handle provided integral therewith or separate therefrom as a combination tool for seating and breaking a tire bead relative to a wheel rim, comprising:

a tool head which comprises (1) a first portion configured and adapted to function as a tool head base and for receiving the handle, (2) a second portion configured and adapted to function as a tire bead breaker, said second portion projecting from said first portion and terminating in a free lateral end, said second portion being relatively thin, so that it may be conveniently inserted between the tire bead and the wheel rim, said second portion further including a knob-like element which extends across said free lateral end and somewhat above the remainder of said second portion, said second portion, in use as a tire bead breaker following insertion thereof between the tire bead and the wheel rim, causing the tire bead to be pushed up and off the wheel rim when the combination tool is rotated about the center of the wheel, said knob-like element acting as a stop to prevent the tire bead from slipping off said second portion, and (3) a third portion configured and adapted to function as a tire bead seater, said third portion projecting upwardly away from said first portion in a slight convex curve in a direction away from said free lateral end of said second portion, said third portion being relatively thin so that it may be conveniently inserted between the tire bead and the wheel rim, said first and

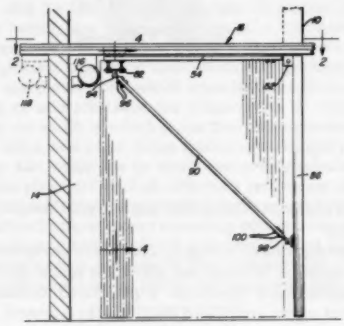
third portions being oriented relative to each other such as to form an open-sided pocket configured to receive a portion of the wheel rim, said third portion, in use as a tire bead seater following insertion thereof between the tire bead and the wheel rim, causing the tire bead to be pushed up and onto the wheel rim when the combination tool is rotated about the center of the wheel, wherein said second portion extends over a portion of the side wall of the tire when the combination tool is used to seat a tire bead in such a manner that said knob-like element bears against the side wall of the tire, thereby assisting in the seating of the tire bead on the wheel rim.

4,133,364

DIAGONAL BRACING FOR LEAD POST OF FOLDING PARTITION

Jay A. Smart, Salt Lake City, Utah, assignor to Jay A. Smart Research, Ltd., Salt Lake City, Utah

Filed Dec. 30, 1977, Ser. No. 866,403
Int. Cl.[2] E05F *15/06*
U.S. Cl. 160—84 R **10 Claims**



1. In combination, an elongated overhead track, a lead post assembly for a foldable barrier including a leading edge to be extended and retracted along and beneath said track, said lead post assembly including a vertical lead post member, a carriage guidingly engaged with said track for shifting therealong, the upper end portion of said lead post member being supported and suspended from said carriage, a horizontal bar underlying said track and extending longitudinally therealong, one end of said bar being anchored relative to said carriage and the other end of said bar projecting along said track in the direction of retraction of said lead post assembly therealong, a guide guidingly engaged with said track for shifting therealong and to which the other end of said bar is anchored, an elongated inclined brace member, and first and second attaching structure attaching the upper and lower ends of said brace member to said guide and said lead post member at a point spaced appreciably below said carriage.

4,133,365

OBSTRUCTION SENSING EDGE FOR A BIFOLDING DOOR

George W. Schleicher, Addison, Ill., assignor to Vapor Corporation, Chicago, Ill.

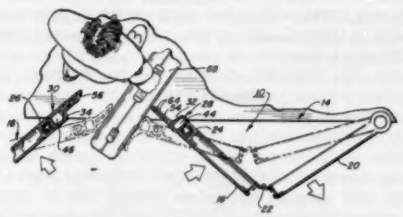
Filed Jun. 8, 1977, Ser. No. 804,710
Int. Cl.[2] E06B *3/48*
U.S. Cl. 160—118 **8 Claims**

1. A fluid pressure sensitive edge assembly for an electrically operated door comprising:

a channel portion for securement to said door;

a first hollow body portion adjacent said channel portion defining an enclosed fluid chamber including fluid therein;

a first edge member defined on said first body portion and extending therefrom substantially along the plane defined by said door; a second hollow body portion defining a second enclosed fluid chamber, a second edge member defined on said second body portion extending along said plane, and fluid actuated switch means for opening said door upon engagement of one of said first and second edge members with an obstruction during the operating cycle of said door causing deformation of one of said first and second fluid chambers and means for communicating said fluid chambers to said switch,



said second edge member adapted to be positioned adjacent and overlapping said first edge member upon said door being closed;

one of said first and second edge members including at least one rib member extending transverse to said one of said first and second edge members and abutting said other of said first and second edge members upon closure of said door thereby providing a seal between said first and second edge members.

4,133,366

SCREEN MOUNTING ARRANGEMENT

Robert A. Jenkins, Sr., Farmington, Mich., assignor to Solar Reflective Film, Inc., Detroit, Mich.

Filed Aug. 12, 1977, Ser. No. 823,985
Int. Cl.[2] E06B *9/52*
U.S. Cl. 160—328 **15 Claims**

1. A mounting arrangement for mounting a flexible panel being stretched within said opening, the mounting arrangement including:

tensioner members secured to respective opposing edges of said flexible panel;

means for releasably securing one of said tensioner members to one side of said opening, including a releasable hooking engagement of said one of said tensioner members;

means for resiliently securing the other of said tensioner members within said opening;

said means including:

a plurality of C-clip members, each of said C-clips comprising a portion thereof affixed to the other side of said opening frame and including an intermediate resiliently deformable spring section and a mounting tang section secured to said other tensioner member;

said spring section of said C-clip adapted to exert a resilient tension force on said tensioner member and being suffi-

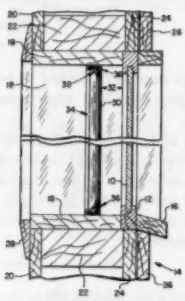
ciently resiliently deformable to enable ready release of said hooking engagement of said one of said tensioner members by deflection thereof, whereby said flexible panel may be stretched within said opening while being readily releasable by disengagement of said hooking engagement.

4,133,367

INSULATING WINDOW AND DOOR CONSTRUCTION

Irwin R. Abell, Portland, Oreg., assignor to Temp-Rite, Inc., Portland, Oreg.

Filed Feb. 10, 1977, Ser. No. 767,500
Int. Cl.[2] E06B 3/30
U.S. Cl. 160—368 R 4 Claims



1. Attachment means for securing panes of various thicknesses, including rigid, semi-rigid and flexible panes, within an opening defined by a frame comprising:

a one-piece rigid framing strip of uniform cross section adapted for attachment to the sides of a frame, said strip including

(a) a base flange;

(b) a support flange intersecting said base flange at 90° to form a corner;

(c) a hook at the free end of said base flange, which hook includes a lip portion extending inwardly toward said support flange in overlying spaced relation to said base flange, and a side flange connecting said base flange to said lip portion; and

(d) a ridge on said support flange projecting toward said hook at a greater distance from said base flange than said lip portion;

and a resilient bead member sized and shaped to be removably retained by said framing strip, said member having a central body portion from which radiate exactly three protuberances including, when operative

(a) a rib portion positioned inwardly of said ridge;

(b) a first bead flange portion positioned within said hook; and

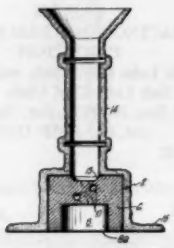
(c) a flexible second bead flange portion extending outwardly past said ridge to position only an outer end portion thereof in at least close proximity to the inner face of said support flange with the remainder of said second bead flange portion, inward of said outer end portion, being spaced a progressively increasing distance from said inner face in the direction toward said ridge such that said rib and first bead flange portions connect said bead strip to said framing strip and said outer end portion of said second bead flange portion exerts a compressive gripping force against panes of widely varying thickness inserted between said outer end portion of said second bead flange portion and said support flange.

4,133,368

SINGLE CRYSTAL CASTING MOLD AND METHOD FOR MAKING SAME

Douglas R. Hayes, Vernon, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 1, 1977, Ser. No. 820,660
Int. Cl.[2] B22C 9/04, 7/02
U.S. Cl. 164—35 8 Claims



1. A ceramic mold for casting single crystal metallic articles, comprising:

an investment mold having a main article cavity and having embedded at its lower end below the article cavity and in communication therewith a preformed ceramic single crystal starter insert, said insert having a growth cavity at the bottom with an open bottom end to engage a chill plate during casting and having an upwardly inclined passage connecting the growth cavity to the article cavity, the passage being suitably configured to select a single metallic crystal from the growth cavity for further propagation through the article cavity.

5. A method for making a ceramic mold for use in casting single crystal metallic articles, comprising:

(a) providing a preformed ceramic single crystal starter insert, said insert having a growth cavity at the bottom with an open bottom end to engage a chill plate during casting, a pattern attachment surface on the end of the insert opposite the growth cavity and an upwardly inclined passage connecting the growth cavity to the pattern attachment surface;

(b) providing a pattern die having an interior cavity in the shape of the article to be cast;

(c) exposing the pattern attachment surface of the insert to the interior cavity of the die and injecting disposable pattern material therein to form an article pattern and simultaneously attach the pattern at said attachment surface atop the starter insert, the upwardly inclined passage of the insert connecting the growth cavity to the article pattern;

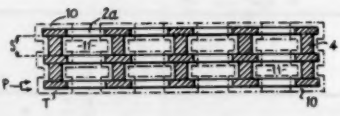
(d) forming a ceramic mold around the assembly of starter insert and disposable article pattern by investment molding, leaving the bottom end of the growth cavity open; and

(e) removing the disposable article pattern from the invested assembly to provide a mold having an article cavity and a preformed starter insert embedded below the article cavity, the growth cavity of the insert being connected to the article cavity by the upwardly inclined passage.

4,133,369
FLUID TREATMENT MODULES

Jacques Maire, Epinay sur Seine, and Robert Gremion, Saint Leu-la-Foret, both of France, assignors to Le Carbone-Corrane, Paris, France

Continuation-in-part of Ser. No. 553,899, Feb. 27, 1975, Pat. No. 4,078,294. This application Mar. 10, 1978, Ser. No. 885,330
Claims priority, application France, Mar. 1, 1974, 74 07016
Int. Cl.[2] B29C *1/08, 13/00;* B22D *23/00*
U.S. Cl. 164—46 8 Claims

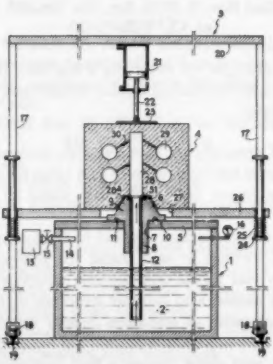


1. A method of making a negative intended for the production of bodies containing cavities of predetermined shape, said negative at least partly matching said cavities, and said cavities forming two independent systems of regularly distributed channels with the channels of one system intercommunicating via ducts which are themselves regularly distributed, said method consisting of stacking plates which are made of an easily disposable substance and which are perforated with regularly distributed holes which leave between them continuous bands of said substance the intersections of which form nodes and the width of which is less than the maximum diameter of the holes, said plates being spaced apart by spacer means which are also made for an easily removable substance and wherein the plates are stacked with each perforation of a plate in alignment with the corresponding perforations in the other plates, and each spacer means extending between two nodes of adjacent plates, forming a layer over the stacked plates and spacer means so as to partially fill the voids between the plates and the perforations in the plates, and removing said plates.

4,133,370
METHOD AND APPARATUS FOR LOW-PRESSURE CASTING IN A SAND MOULD

Rio Bellocci, and Michel Degois, both of Pont-a-Mousson, France, assignors to Pont-a-Mousson S.A., Nancy, France

Division of Ser. No. 642,631, Dec. 19, 1975, Pat. No. 4,008,749. This application Nov. 17, 1976, Ser. No. 742,480
Claims priority, application France, Dec. 24, 1974, 74 42713
Int. Cl.[2] B22D *17/06, 17/26*
U.S. Cl. 164—309 9 Claims

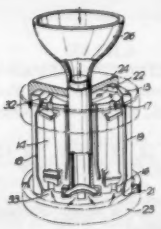


1. In a low-pressure metal casting apparatus comprising a large capacity fluidtight vessel having an interior containing liquid metal to cast; means defining a supply pipe having an upper outlet opening and a lower inlet opening, the pipe partly extending into the vessel through a wall of the vessel and having a lower end portion immersed in the metal; means defining an upper annular surface surrounding and integral with the upper opening; a source of gas under pressure; a device interposed between the source and the vessel interior for selectively putting the source in communication with the interior of the vessel and closing off said communication; a mould having a mould cavity, a runner whose sectional size is in the neighborhood of the sectional size of the supply pipe and communicates with the mould cavity and has a lower open end portion; means defining a lower annular surface surrounding and integral with said lower open end portion of the runner; and means for releasably holding the mould assembled with the supply pipe on said upper and lower annular surfaces so that the supply pipe and the runner are in alignment eith each other during casting; the improvement comprising annular sealing means interposed between the mould and the supply pipe and capable of withstanding the pressure and temperature of the molten metal during the filling of the mould cavity while allowing a rapid separation of the mould from the supply pipe upon release of said holding means and ensuring that said upper annular surface is clean enough to immediately receive a mould for a following casting operation, said sealing means comprising a pasty refractory product which is located on opposite annular sides of said sealing means and is in a compressed state due to the action of said holding means and is in contact with said upper and lower annular surfaces, said product being thermosettable by a supply of heat from the supply pipe, said upper annular surface being smoother than said lower annular surface so as to be less capable of adhering to said pasty product than said lower annular surface; said holding means comprising frame means having at least one side member on each side of said mould and a top member connected to said members and extending over said mould, jack means mounted on the underside of said top member and engageable with the upper surface of said mould, support means carried by said side members and disposed beneath said mould for supporting said mould and elastically yieldable means interposed between said frame means and said support means biasing said support means upwardly; said support means being vertically movable relative to said frame means under the action of said jack means in opposition to the action of said elastically yieldable means so as to move said mould toward said supply pipe.

4,133,371
CASTING

Ivan J. Birch, and David Mills, both of Bristol, England, assignors to Rolls-Royce Limited, London, England

Filed Aug. 22, 1977, Ser. No. 826,545
Claims priority, application United Kingdom, Aug. 31, 1976, 36031/76
Int. Cl.[2] B22C *9/08*
U.S. Cl. 164—350 14 Claims



1. A mold assembly for producing multiple castings comprising a plurality of individual elements each defining a part of a mold cavity; means holding a plurality of said elements in an array with the complementary cavity parts in registry to define a plurality of mold cavities, the upper and lower surfaces of said elements defining with said means two spaces at opposite

ends of the array, said elements defining a runner passage from each mold cavity to both of said spaces and a central passageway interconnecting said spaces.

4,133,372

APPARATUS FOR BLASTING CASTINGS

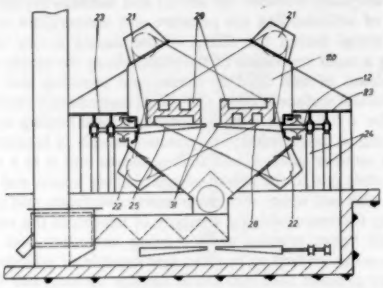
Martin Weis, Ettlingen, and Adolf Scholz, Karlsruhe, both of Germany, assignors to Badische Maschinenfabrik GmbH, Germany

Filed Feb. 3, 1976, Ser. No. 654,907

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1975, 2504444

Int. Cl.[2] B22D *29/00*

U.S. Cl. 164—404 **16 Claims**



1. A cast workpiece blasting apparatus comprising:

at least one cabin means for blasting cast workpieces with granular material, such as sand and the like, in a confined enclosure,

a conveyor means including a plurality of workpiece carrier means for conveying cast workpieces of nonuniform dimensions through said blasting cabin means, each of said plurality of workpiece carrier means being fashioned with a plurality of approximately equally spaced tapered grate bars, said plurality of workpiece carrier means forming said conveyor means as a continuous, uninterrupted arrangement of approximately equally spaced tapered grate bars,

means for securing only one end of each of said plurality of workpiece carrier means to the conveyor means, said securing means allowing said grate bars to be freely suspended so as to configure the conveyor means as a cantilever-type arrangement, and

a shifting means, operatively associated with the conveyor means, including a means for engaging the cast workpieces on said grate bars and for applying a thrust to the cast workpieces so as to shift the cast workpieces towards a free end of the grate bars to load and unload the cast workpieces from the workpiece carrier means at the grate bars.

4,133,373

LEAK DETECTING APPARATUS

William E. Slagley, Crown Point, and Peter K. Strangway, Munster, both of Ind., assignors to Inland Steel Company, Chicago, Ill.

Filed Aug. 12, 1977, Ser. No. 823,959

Int. Cl.[2] G01M *3/08*

U.S. Cl. 165—11 **8 Claims**

1. A cooling system for a vessel containing hot gas, said cooling system comprising:

a cooling circuit having an upstream end and a downstream end;

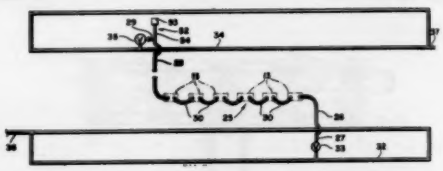
said cooling circuit comprising at least one cooling member including means through which a cooling liquid may be circulated;

said cooling member having an inlet for said cooling liquid connected to said upstream end of the cooling circuit and an outlet for the cooling liquid connected to said downstream end of the cooling circuit;

a container;

coupling means connecting said container in fluid communication with said cooling circuit adjacent said downstream end of the cooling circuit;

said container being disposed at an elevation higher than that part of said cooling circuit to which the container is connected;



said container and said coupling means comprising means cooperating with said cooling circuit for filling the interior of said container with cooling liquid in the absence of gas in said cooling circuit and for displacing the cooling liquid in said container with gas when gas enters said cooling circuit; and

means for displaying the displacement of said cooling liquid from said container by said gas.

4,133,374

HEAT EXCHANGER

James A. York, Glendale, Calif., assignor to Smith Engineering Company, South El Monte, Calif.

Filed Dec. 2, 1976, Ser. No. 746,695

Int. Cl.[2] F28F *5/00*

U.S. Cl. 165—82 **3 Claims**

1. A heat exchanger for receiving a hot inlet fluid from an inlet means and for providing cooler outlet fluid to an outlet means comprising:

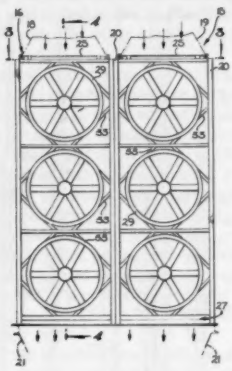
a frame;

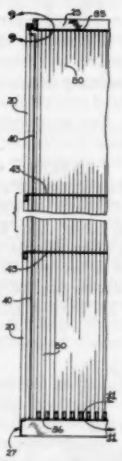
a plurality of generally parallel, vertical, elongated tubes for receiving said hot fluid, each of said tubes having an upper end and a lower end, said tubes disposed within said frame;

a support structure fixedly coupled to the lower end of said tubes and secured to said frame for providing vertical support to said tubes, said support structure coupled to said outlet means, said support structure includes a sheet having a plurality of apertures fixedly secured in alignment with said tubes and a plurality of beams for stiffening said sheet, said sheet having a first surface for securing said beams thereto, and a second surface for securing said tubes thereto;

an inlet bulkhead including a tube sheet secured thereto coupled between said inlet means and said upper ends of said tubes, said bulkhead floatingly mounted within said

frame such that as said tubes expand said inlet bulkhead is permitted to move freely vertically; and





means cooperating with said tubes for introducing fluid in heat exchange relationship with said hot inlet fluid.

4,133,375

VERTICAL HEAT EXCHANGER

Joseph C. V. Ducasse, Martinez, and Jean Bouvet, San Anselmo, both of Calif., assignors to Unice Machine Company, San Francisco, Calif.

Filed Jan. 28, 1977, Ser. No. 763,536

Int. Cl.[2] F28F *5/04*

U.S. Cl. 165—92 **33 Claims**

1. A heat exchanger unit comprising:

a rotatably mounted hollow shaft having first and second ends;

at least one heat exchange element concentrically surrounding and attached to said shaft, said element comprising:

a first plurality of hollow radial members extending radially outwardly from said shaft;

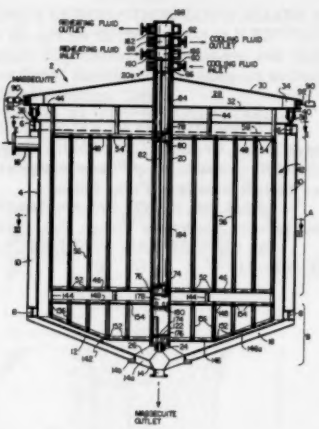
a second plurality of hollow radial members extending radially outwardly from said shaft;

said first radial members being positioned further from said first end of said shaft than said second radial members, in the axial direction of said shaft;

each first radial member being aligned in said axial direction with a respective said second radial member;

each pair of adjacent said first radial members and the axially aligned pair of adjacent second radial members defining a cylindrical sector; and

each said sector having extending in said axial direction at least one rectangular hollow duct, the interior of which is in communication with the interiors of the respective pairs of first and second radial members defining such sector;



fluid inlet means for supplying heat exchange fluid from said first end of said shaft to said first radial members, whereby fluid flows radially outwardly through said first radial members, then axially through said hollow ducts, and then radially inwardly through said second radial members; and

fluid outlet means for passing said fluid from said second radial members to said first end of said shaft.

4,133,376

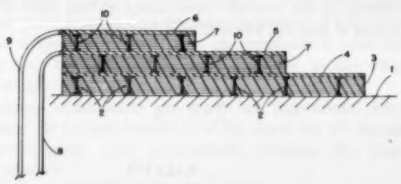
ADVANCED CRYOGENIC MULTI-STAGED RADIATOR SYSTEM

Stanton L. Eilenberg, Irvine; Melvin Feiner, Huntington Beach; Charles L. Shuford, Palos Verdes, and David W. Triplett, Seal Beach, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 31, 1977, Ser. No. 802,154

Int. Cl.[2] F28F *13/00*

U.S. Cl. 165—105 **8 Claims**



1. A cooling device for maintaining one or more heat producing sources at selected temperatures and comprising:

a mounting surface;

at least two superposed and spaced-apart radiation elements, each successively of lesser area than the next said radiation element closer to said mounting surface, and each adapted to radiate heat;

at least one heat pipe in thermal conductivity with each of said radiation elements; and

thermal insulation means in the space between said mounting surface and the radiation element closest to said mounting surface and between each two successive radiation elements to thermally isolate them from each other, whereby

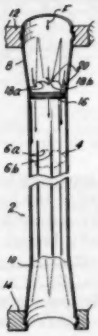
a portion of the surface facing away from said mounting surface of the larger in area of each two successive radiation elements is exposed to cooling temperature and the entire surface facing away from said mounting surface of the radiation element most remote from said mounting surface is exposed to cooling temperature.

4,133,377

THIN-FILM HEAT EXCHANGER

Jacques de Lallée, Grenoble; Gérard Marie, Eybens, and Robert Moracchioli, Grenoble, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 8, 1977, Ser. No. 766,574
Claims priority, application France, Feb. 12, 1976, 76 03875
Int. Cl.[2] F28D *3/04;* F28F *1/06, 25/04*
U.S. Cl. 165—118 **12 Claims**



1. A heat exchanger for exchanging heat between a first fluid or so-called hot fluid and a second fluid to be heated, of the type comprising at least one vertical wall which provides a separation between said fluids and through which a heat transfer process takes place, wherein the wall aforesaid which comprises an upper end and the cross-section of which is constituted by a uniform succession of wavy corrugations which define in alternate sequence convex wave crests and concave wave troughs, and wherein said heat exchanger includes means for introducing said second fluid at said upper end only in the vicinity of the convex wave crests of that face of said wall which is directed towards said second fluid.

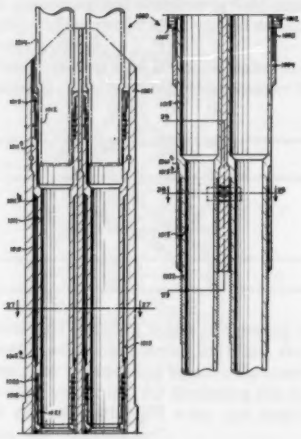
4,133,378

WELL TUBING HEAD

John C. Gano, Carrollton, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Division of Ser. No. 708,843, Jul. 26, 1976. This application Nov. 21, 1977, Ser. No. 853,107
Int. Cl.[2] E21B *17/02, 23/00, 33/035*
U.S. Cl. 166—85 **3 Claims**

3. A tubing head comprising: a body provided with an external no-go shoulder for supporting said head in a wellhead housing and provided with longitudinal flow passage means therein; means on said body for rotationally orienting said body and locking said body at a desired position of rotation responsive to lowering a wellhead fitting onto said body; longitudinal slidable conduit means in said body flow passages for spacing-out functions; and means between said body and said slidable conduit means for locking said slidable conduit means



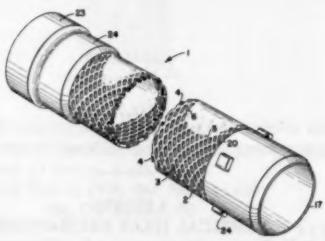
against longitudinal movement in said body after said spacing-out functions.

4,133,379

FORAMINOUS SCREENING DEVICE AND METHOD FOR MAKING SAME

Carl E. Nuzman, R.R. 1, Silver Lake, Kans. 66539, and John S. McGuire, 823 N. Hamilton, Olathe, Kans. 66061

Continuation-in-part of Ser. No. 698,405, Jul. 21, 1976, abandoned. This application Sep. 19, 1977, Ser. No. 834,694
Int. Cl.[2] E03B *3/20;* E21B *43/08*
U.S. Cl. 166—234 **8 Claims**



1. A method for manufacturing a cylindrically shaped, foraminous, self-supporting screening device comprising the steps of:

(a) wetting a plurality of solid glass filaments with a liquid, heat-hardenable, synthetic resin;

(b) collecting said wetted filaments into a continuous strand;

(c) providing a mandrel having first and second groove sets therein having opposing ends each with a peripheral surface; both of said sets having a plurality of mutually parallel, axially spaced and helically shaped grooves; the grooves of said first set having a clockwise orientation and intersecting the counterclockwise oriented grooves of said second set;

(d) tensing said strand;

(e) winding said strand under tension into a groove of said first set from one end of said mandrel to the other end thereof;

(f) anchoring said tensed strand by frictionally engaging the strand with the peripheral surface of the other mandrel

end to lock the tension in a last wound segment of said strand;

(g) reversing the direction of said winding;

(h) winding said strand under tension into a groove of said second set from said other mandrel end to said one mandrel end;

(i) anchoring said tensed strand by frictionally engaging the strand with the peripheral surface of the one mandrel end to lock the tension in a last wound segment of said strand;

(j) repeating the steps of winding under tension into said first set groove, anchoring the strand at the one mandrel end to lock the tension into the last wound segment, reversing said winding direction, winding into said second set groove and anchoring the strand at the other mandrel end, until each of said first and second set grooves is filled to a predetermined point below and uppermost edge of said grooves; each of said tensed strands being embedded and interconnected in a matrix of synthetic resin;

(k) curing said tensed strands while the same are disposed on said mandrel; and

(l) removing the mandrel from said cured strands.

8. A foraminous screening device comprising:

(a) a tubular, self-supported body having a plurality of spaced apart apertures therethrough and comprising a network of helically shaped ribs; wherein

(b) said network includes first and second rib sets both having a plurality of mutually parallel and axially spaced ribs therein; the ribs of said first set having a clockwise orientation and being interwoven and connected at points of intersection to the ribs of said second set; said second set being oriented in a counterclockwise direction;

(c) each of said ribs comprising a plurality of axially oriented, overlying bundles of tensed, solid, glass filament imbedded and interconnected in a matrix of hardened synthetic resin; each of said bundles constitutes a portion of a continuous, elongated glass filament strand; and

(d) said ribs being formed by the steps including:

(1) wetting a plurality of solid glass filaments with a liquid, heat-hardenable, synthetic resin;

(2) collecting said wetted filaments into a continuous strand;

(3) providing a mandrel having first and second groove sets therein having opposing ends each with a peripheral surface; both of said sets having a plurality of mutually parallel, axially spaced and helically shaped grooves; the grooves of said first set having a clockwise orientation and intersecting the counterclockwise orientated grooves of said second set;

(4) tensing said strand;

(5) winding said strand under tension into a groove of said first set from one end of said mandrel to the other end thereof;

(6) anchoring said tensed strand by frictionally engaging the strand with the peripheral surface of the other mandrel end to lock the tension in a last wound segment of said strand;

(7) reversing the direction of said winding;

(8) winding said strand under tension into a groove of said second set from said other mandrel end to said one mandrel end;

(9) anchoring said tensed strand by frictionally engaging the strand with the peripheral surface of the one mandrel end to lock the tension in a last wound segment of said strand;

(10) repeating the steps of winding under tension into said first set groove, anchoring the strand at the one mandrel end to lock the tension into the last wound segment, reversing said winding direction, winding into said second set groove and anchoring the strand at the other mandrel end, until each of said first and second set grooves is filled to a predetermined point below and uppermost edge of said grooves; each of said tensed strands being embedded and interconnected in a matrix of synthetic resin;

(11) curing said tensed strands while the same are disposed on said mandrel; and

(12) removing the mandrel from said cured strands.

4,133,380

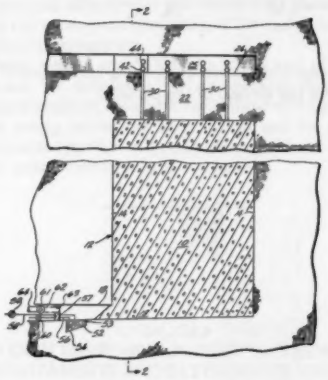
ESTABLISHING A COMBUSTION ZONE BELOW A SILL PILLAR IN AN IN SITU OIL SHALE RETORT

Robert S. Burton, III; Carlon C. Chambers, and Robert F. Hughes, all of Grand Junction, Colo., assignors to Occidental Oil Shale, Grand Junction, Colo.

Filed Jul. 11, 1977, Ser. No. 814,481

Int. Cl.[2] E21B *43/24, 43/26*

U.S. Cl. 166—259 **23 Claims**



20. A method for igniting an in situ oil shale retort in a subterranean formation containing oil shale, the retort being defined by top, bottom and side boundaries of unfragmented formation and containing a fragmented permeable mass of formation particles containing oil shale, the method comprising the steps of:

establishing a combustion zone at a first point in the fragmented mass adjacent the top boundary;

introducing an oxygen containing gas into the fragmented mass in the combustion zone for combustion of carbonaceous material in oil shale and for producing combustion gas;

withdrawing combustion gas from the fragmented mass at a second point adjacent the top boundary of the retort, said second point being within the side boundaries of the retort and at a location remote from the combustion zone for advancing the combustion zone laterally in the fragmented mass; and thereafter

withdrawing combustion gas from the fragmented mass adjacent the bottom boundary of the retort for advancing the combustion zone downwardly through the fragmented mass.

4,133,381

CONTACTING TREATED OIL SHALE WITH CARBON DIOXIDE TO INHIBIT LEACHING

Robert D. Stewart, Yorba Linda, Calif., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

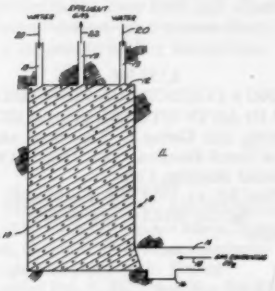
Filed Dec. 27, 1977, Ser. No. 864,453

Int. Cl.[2] E21B *43/24; C01F 11/18*

U.S. Cl. 166—261 **18 Claims**

3. A method for inhibiting leaching of water-soluble constituents from a particle containing treated oil shale and including oxides of alkaline earth metals comprising the steps of contact-

ing such a particle with steam and contacting such particle with carbon dioxide for a sufficient time to produce a substantially water-insoluble barrier comprising carbonates of alkaline earth metal at the surface of the particle.

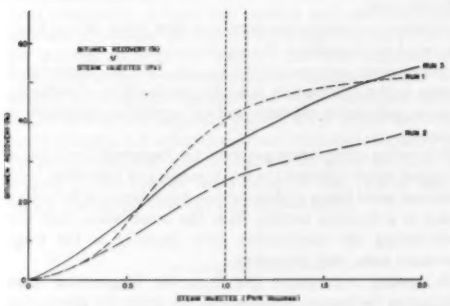


4,133,382

RECOVERY OF PETROLEUM FROM VISCOUS PETROLEUM-CONTAINING FORMATIONS INCLUDING TAR SANDS

Phillip J. Cram, and Roman A. Pachovsky, both of Calgary, Canada, assignors to Texaco Canada Inc., Calgary, Canada

Filed Sep. 28, 1977, Ser. No. 837,078
Int. Cl.[2] E21B *43/22, 43/24*
U.S. Cl. 166—263 **28 Claims**



1. A method for the recovery of hydrocarbons from a subterranean hydrocarbon-bearing formation traversed by at least one injection well and one production well and having fluid communication therebetween, comprising the steps of:

(a) injecting via said injection well a first mixture comprising an oxygen-containing gas and steam, until the maximum recovery efficiency has been attained and starts to decline and simultaneously producing said formation hydrocarbons via said production well,

(b) terminating injection of said first mixture and undertaking injection of a second mixture comprising a light hydrocarbon and steam and continuing to produce said formation hydrocarbons via said production well,

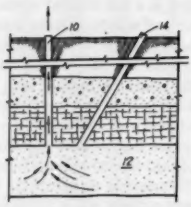
wherein a pressurization and drawdown cycle is employed during at least one of said steps (a) and (b).

4,133,383

TERMINATING THE FLOW OF FLUIDS FROM UNCONTROLLED WELLS

John W. Ely, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Sep. 16, 1977, Ser. No. 833,856
Int. Cl.[2] E21B *35/00, 33/138*
U.S. Cl. 166—270 **17 Claims**



1. A method of terminating the flow of formation fluids from an uncontrolled well penetrating said formation, said method comprising the steps of:

introducing a low viscosity fluid into said formation by way of at least one separate well penetrating said formation, wherein said low viscosity fluid is introduced into said formation under conditions insufficient to produce a fracture therein and further wherein said low viscosity fluid becomes highly viscous after having been introduced into said formation; and

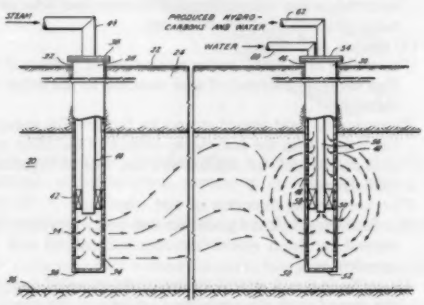
continuing said introduction of said low viscosity fluid into said formation by way of said separate well until said low viscosity fluid surrounds the portion of said formation adjacent said uncontrolled well and becomes highly viscous in said formation thereby terminating the flow of formation fluids to said uncontrolled well.

4,133,384

STEAM FLOODING HYDROCARBON RECOVERY PROCESS

Joseph C. Allen, Bellaire, Tex., and John W. Porter, Metairie, La., assignors to Texaco Inc., New York, N.Y.

Filed Aug. 22, 1977, Ser. No. 826,446
Int. Cl.[2] E21B *43/24, 43/22*
U.S. Cl. 166—272 **3 Claims**



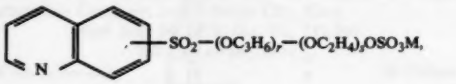
1. A method for recovering hydrocarbons from a subterranean, hydrocarbon-bearing formation penetrated by an injection well and a production well which comprises:

a. injecting via the injection well a fluid selected from the group consisting of steam and a mixture of steam and carbon dioxide into the said hydrocarbon-bearing formation to drive said hydrocarbons toward said production well,

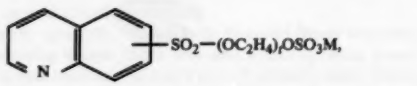
b. injecting water via the production well into the surrounding formation at an upper horizon of the said hydrocarbon-bearing formation, and passing said water down-

wardly through the formation about the production well to a lower horizon in the said formation and then back into the production well from the surrounding formation at the lower horizon,

c. producing a mixture of the displaced hydrocarbons and the injected water at the lower horizon via the mixture, and wherein the said fluid injected in (a) contains from about 0.01 to about 0.10 weight percent of an interfacial tension reducer selected from the group consisting of a compound of the formula:



wherein r is an integer of from 2 to about 5, s is an integer of from 8 to about 60, wherein the sum of r plus s is not more than 55 and M is selected from the group consisting of hydrogen, sodium, potassium and the ammonium ion, and a compound of the formula:



wherein t is an integer of from 8 to about 40, and M has the same meaning as previously described.

4,133,385

OXIDIZED LIGNOSULFONATES AS ADDITIVES IN OIL RECOVERY PROCESSES INVOLVING CHEMICAL RECOVERY AGENTS

George Kalfoglou, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 745,496, Nov. 26, 1976, abandoned, which is a continuation-in-part of Ser. No. 715,957, Aug. 19, 1976, abandoned, and Ser. No. 591,573, Jun. 30, 1975, abandoned, and Ser. No. 591,574, Jun. 30, 1975, Pat. No. 4,006,779. This application Jun. 20, 1977, Ser. No. 807,948

Int. Cl.[2] E21B *43/22*

U.S. Cl. 166—273 **7 Claims**

1. In a method for recovering oil from a subterranean formation containing oil and having an injection well and a production well wherein an aqueous surfactant solution is injected into the injection well in order to drive the oil to the production well wherein it is produced the improvement which comprises:

injecting into the injection well in admixture with the surfactant oxygen or ozone oxidized lignosulfonates in an amount effective for reducing the extent of adsorption of the surfactant by the formation matrix.

4,133,386

DRILL PIPE INSTALLED LARGE DIAMETER CASING CEMENTING APPARATUS AND METHOD THEREFOR

Lloyd C. Knox, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Dec. 17, 1976, Ser. No. 751,511

Int. Cl.[2] E21B *23/00, 33/127, 33/129, 33/14*

U.S. Cl. 166—285 **16 Claims**

5. A method for cementing a casing in a wellbore, which comprises the steps of:

(a) installing an adapter in the casing;

(b) lowering the casing and installed adapter into the wellbore;

(c) installing an unactuated device, having a closed passageway therethrough, on a conduit;

(d) positioning the conduit and installed device within the casing at a first position adjacent the adapter;

(e) actuating the device;

(f) pumping fluid through the conduit and into said device so as to interlock a first section of the device with the adapter to restrain the device from upward movement within the casing so as to expand a second section of the device to isolate a first interior region of the casing above the interlocked device from a second internal region of the casing below the interlocked device;

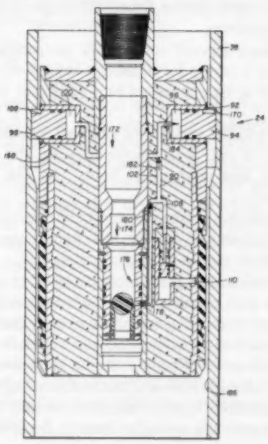
(g) actuating a lock mechanism by continued pumping so as to maintain the first and second sections of the device in interlocked and expanded positions, respectively and thereafter open the closed passageway to communicate the second region with the conduit;

(h) introducing a quantity of cement through the conduit and opened passageway into the second region; and

(i) thereafter closing the passageway.

9. Apparatus connectable to a conduit for placement within a casing and subsequent cementing of the casing to a surrounding wellbore, comprising:

(a) body means, attachable to a lower end of the conduit means, for defining a first passageway therethrough in communication with both the conduit and a first region of the casing below the body means and for occupying a substantial portion of an interior area of a second region of the casing surrounding the apparatus;



(b) extensible interlock means, attached to said body means and having a second passageway in closed communication with the first passageway, for extending into interlocked engagement with said casing upon opening of the second passageway and subsequent introduction of a quantity of fluid into the second passageway;

(c) extensible seal means, sealingly attached to the body means and having a third passageway in closed communication with the first longitudinal passageway, for distending into and sealing the annulus between the body means and the second region of the casing upon opening of the third passageway and introduction of a quantity of pressurized fluid into the third passageway;

(d) first valve means, attached to the body means, for opening the second and third passageways upon sealing engagement of a first closure means with said first valve means and subsequent pressurization of the upper portion of the first passageway to at least one predetermined pressure, for closing the second and third passageways upon extension of both the interlock and seal means and for thereafter opening the first passageway;

(e) first closure means for movement through the conduit and sealing engagement with the first valve means; and

(f) second closure means for moving through said conduit

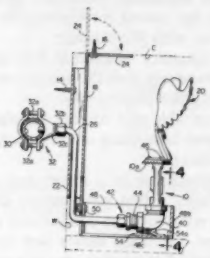
and into sealing engagement with the first passageway to close the first passageway.

4,133,387

MOUNTING DEVICE FOR SPRINKLER HEAD

Edward Tervidis, Gager Hill Rd., Scotland, Conn. 06264

Filed Aug. 8, 1977, Ser. No. 822,946
Int. Cl.[2] A62C *37/08*
U.S. Cl. 169—51 5 Claims



1. A decorative device for supporting a sprinkler head, said device comprising:

(a) a plaque having rearwardly projecting spacer means defining a cavity for housing a length of conduit which is adapted to be connected to a houshold water pipe or the like,

(b) a forwardly projecting channel mounted to the front surface of said wall plaque adjacent the lower side edge thereof, and adapted to house the end portion of said conduit,

(c) elbow fitting means adapted to be connected to the end of said conduit and having attachment means for securing said elbow means in said channel,

(d) a sprinkler head threadably received in said elbow fitting means, said sprinkler head including a frame to support the upper end of a fusible link such that the lower end supports the sprinkler head valve to hold it closed, and a deflector on said frame to direct the upwardly discharged water through 360° in a conventional spray pattern, and

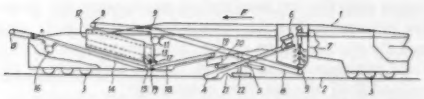
(e) a decorative figurine mounted to said deflector and located above the sprinkler head in front of said plaque.

4,133,388

BALLAST CLEANING AND LEVELLING MACHINE

Jean-Jacques Boyer, Montchauvet (Yvelines), France

Filed Jun. 6, 1977, Ser. No. 804,156
Int. Cl.[2] E01B *27/06*
U.S. Cl. 171—16 2 Claims



1. A ballast cleaning and levelling machine for removing old ballast from a railway road bed and for separating spoil from cleaned ballast, comprising at least a clearing excavator, elevating means, at least one screening assembly and conveyors for on the one hand evacuating the spoil and on the other hand returning the cleaned ballast to the railway road bed, said machine further comprising between the excavator and the screening assembly a coarse crushing device acting on the old ballast removed by the excavator.

4,133,389

HAND-HELD POWER DRIVEN CULTIVATOR

Walter F. Ruhl, Greenville, and Robert R. Yeager, Union City, both of Ohio, assignors to Lambert Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 714,231, Aug. 13, 1976, abandoned. This application Jun. 29, 1977, Ser. No. 811,196
Int. Cl.[2] A01B *33/06*
U.S. Cl. 172—41 2 Claims

1. A hand-held power cultivator comprising a handle, a housing carried on an end of said handle, an electric drive motor in said housing, reduction gearing in said housing connected to said drive motor, means in the bottom of said housing rotatably supporting a pair of output shafts in underlying relation to said motor and in angled relation to each other and to a vertical plane extending therebetween, said shafts being inclined outwardly at an angle substantially greater than 0° but less than 45° to said vertical plane and being laterally spaced from each other, gear drive means in said housing interconnecting said shafts to said reduction gearing providing for counter-rotational movement of said shafts relative to each other, and a separate tined ground tiller carried on each of said shafts at the lower ends thereof, each of said ground tillers having a tine support portion peripherally terminated in a single annular row of generally downwardly extending tines, which tines are outwardly angled with respect to the axis of the respective said shafts and proportioned to engage the earth underlying said housing and which move when rotated by said shafts in non-intersecting inclined paths, the angle of said tines to the respective said shafts being approximately the same as the said angle of said shafts to said vertical plane so that adjacent said tines at their closest proximity in said paths extend generally parallel to each other and to said vertical plane.

4,133,390

TINE ARRANGEMENTS FOR GARDEN TILLERS

Leonard V. Reaume, Jackson, Miss., assignor to Magna American Corporation, Raymond, Miss.

Filed Mar. 11, 1976, Ser. No. 665,890
Int. Cl.[2] A01B *33/02*
U.S. Cl. 172—43 8 Claims

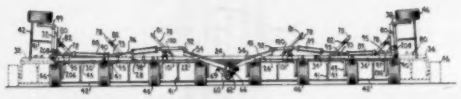
1. A tine assembly for garden tillers comprising a plate, a

plurality of tines of a given length fixed to said plate, and a plurlaity of tines of a length shorter than said given length also fixed to said plate, a said tine of shorter length being interposed between a pair of said tines of given length, whereby a clod loosened in soil entered by a said tine of given length will be broken by a said tine of shorter length.

4,133,391
FOLDING FLEXIBLE UNDERCUTTER PLOW

Raymond W. Richardson; Robert E. Burda, and John C. Crumrine, all of Cawker City, Kans., assignors to Richardson Manufacturing Company, Inc., Cawker City, Kans.

Filed Aug. 24, 1976, Ser. No. 717,501
Int. Cl.[2] A01B *15/14*
U.S. Cl. 172—311 **13 Claims**



11. In an articulated implement;

a normally generally horizontally disposed frame assembly comprising a base frame unit and a pair of wing frame units, said base unit having a pair of primary, outer frame sections and each of said wing units having a plurality of side-by-side sections including innermost and outermost sections thereof;

hinge means swingably innerconnecting each of said sections of said wing units with an adjacent section, and swingably connecting the innermost sections thereof to corresponding primary frame sections of said base unit, said hinge means defining a fore and aft, generally horizontal axis at each connection thereof for relative movement of said sections of the wing units between normal, generally horizontal, unfolded positions and folded, transport positions;

power means for sequentially folding and unfolding said wing units, commencing with the outermost section of each wing unit for folding operation and commencing with the innermost section of each wing unit for unfolding operation;

a support arm on one of said sections of each wing unit extending upwardly therefrom when said one section is in its unfolded position, and engageable with an adjoining outboard section upon movement of the latter to its folded position,

said power means being coupled with said adjoining outboard section of each wing unit for swinging the same to its folded position in engagement with the associated support arm, and for then swinging said one section and adjoining outboard section in unison to the folded position of said one section;

a gravity operated lock operably associated with said adjoining outboard section and associated support arm of each wing unit for innerlocking the same as said adjoining section and one section swing in unison toward the folded position of said one section whereby, upon unfolding operation of said power means, the lock in each wing unit causes said one section and adjoining section thereof to unfold in reverse sequence;

a pair of draft beams each having opposed, forward and rearward ends;

structure coupling said beams to corresponding primary frame sections of said base unit and providing an axis of rotation for each beam parallel to the longitudinal axis thereof and disposed between each beam and the corresponding frame section;

a pair of hitch arms having opposed, forward and rearward ends, the rearward ends being spaced apart;

a pair of couplings connecting the rearward ends of said arms with respective beams;

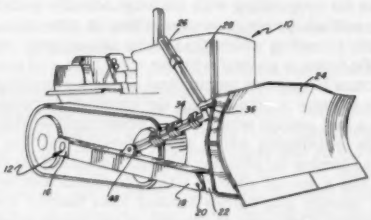
means intercoupling the forward ends of said arms for connecting the same to a drawing vehicle; and

said power means including a pair of extensible and retractable actuators each acting between a respective beam and the adjacent wing unit.

4,133,392
CUSHION LINK AND HYDRAULIC STABILIZER FOR BULLDOZER BLADE

Gary P. Freese, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sep. 29, 1977, Ser. No. 837,965
Int. Cl.[2] E02F *3/76*
U.S. Cl. 172—809 **13 Claims**

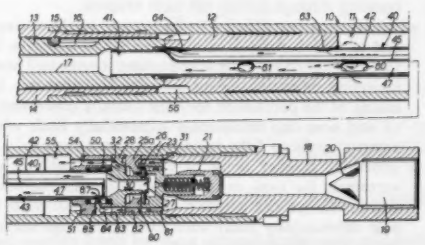


1. A tractor having a bulldozer blade, a push frame having a pair of push arms, each push arm being connected to said tractor and to a lower corner of said blade, a link extending between each push arm and an upper corner of said blade, each link having a cylinder with a cavity, a pair of spaced apart apertured walls in said cylinder dividing the cavity into three separate chambers, a rod extending into said cavity, said rod having a cushioning piston and a hydraulic piston secured thereto with the cushioning piston disposed in one end chamber and the hydraulic piston disposed in the other end chamber, cushioning means in said one end chamber for cushioning loads applied to said rod by said blade, hydraulic means connecting the head ends and rod ends of the respective hydraulic pistons in series whereby excess loads on the rod of one link will be transmitted through the hydraulic means to the hydraulic piston in the other link to stabilize the loads received by the links from the blade.

4,133,393
DOWN-THE-HOLE PERCUSSION DRILLS

Ernest J. Richards, Redruth, England, assignor to Compair Construction and Mining Limited, Camborne, England

Filed Jul. 25, 1977, Ser. No. 818,760
Claims priority, application United Kingdom, Jul. 28, 1976, 31475/76
Int. Cl.[2] B25D *17/14*
U.S. Cl. 173—64 **7 Claims**



1. A down-the-hole fluid-pressure-operated drill, compris-

ing, a drill body having a fluid inlet on an upper end thereof and having an internal cylinder, a hammer piston reciprocable within said cylinder, upper and lower working chambers at opposite ends of said cylinder, pressure-responsive distribution valve means arranged to deliver pressurized working fluid from said inlet alternately to the upper and lower working chambers for effecting respectively a power stroke and a return stroke of the hammer piston in said cylinder, mounting means for mounting an anvil associated with a drill bit in the lower end of the drill body for impacting said hammer piston against said anvil at the end of each power stroke, an exhaust passage located at the lower end of the drill body for delivery of exhaust fluid from the working chambers to the exterior of the drill body at the lower end thereof for flushing purposes, a tubular structure, having longitudinally spaced parts therein, mounted within the drill body and extending longitudinally through said cylinder and through an axial bore in the hammer piston, said hammer piston being slideable over said tubular structure for cooperating with the longitudinally spaced ports therein, said tubular structure comprising an outer tube and an inner tube extending within the interior of said outer tube, the inner tube being in contact with the outer tube, and said tubular structure having two longitudinal passages extending therethrough to carry working fluid, the longitudinal passages including a first passage which carries pressurized working fluid from the distribution valve means directly into the lower working chamber for effecting the return stroke of the hammer piston, and a second passage which communicates with the exhaust passage and carries exhaust fluid thereto from the upper working chamber at the end of the power stroke and from the lower working chamber at the end of the return stroke, one of said longitudinal passages being defined between the wall of the outer tube and one longitudinal indentation formed in a part of the wall of the inner tube, the remainder of the circumference of said wall part lying against the inner surface of the wall of the outer tube, the indentation at its lower end terminating short of the corresponding end of the inner tube to thereby terminate that end of the respective longitudinal passage, and another of said longitudinal passages being formed by the interior of the inner tube, and portions of the walls of the inner and outer tubes which lie in contact with one another having apertures therein respectively capable of being placed in registry with one another so as to define the ports of the tubular structure.

4,133,394

PERCUSSION TOOL

Maurice Wohlwend, 5001 S. 112th St., Seattle, Wash. 98176

Filed Aug. 29, 1977, Ser. No. 828,313

Int. Cl.[2] B25D *9/00*; B23B *5/22*

U.S. Cl. 173—139 **12 Claims**

1. In a percussion tool of a type including a casing, an internal hammer, a protruding moil, means for driving the hammer to repeatedly strike the moil, and a cushioned moil stop, the improvement comprising:

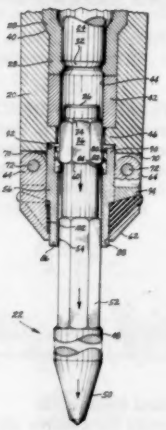
longitudinally displaceable nose bushing means including an impact surface, an outwardly extending substantially radial flange terminating substantially flush with the exterior surfaces of the lower end of said casing, and an axial opening through which the moil extends.

a hollow nose cap adapted to be secured to the casing, one end of which defines an aperture which receives therethrough a portion of the nose bushing means, said nose cap including mounting means securing the nose cap to the casing of the percussion tool, the radially outermost parts of said nose cap terminating substantially flush with the exterior surface of the lower end of said casing;

a generally annular body of elastomeric material which surrounds the moil, is sandwiched between the nose cap and the flange and whose radially outermost parts terminate substantially flush with the exterior surface of the lower end of said casing; and

an impact surface on the moil;

wherein when the moil moves past a predetermined position, the impact surface on the moil collides with the impact surface on the nose bushing means, to compress the resilient material between the nose cap and the flange on the



nose bushing means, thereby causing substantially all of the flow of the resilient material to flow generally radially outwardly with respect to the nose bushing means and bringing the moil to a cushioned stop.

4,133,395

EARTH BORING ASSEMBLY WITH DRAG PIPE

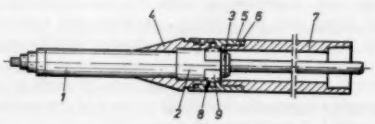
Paul Schmidt, Reiherstrasse, 5940 Lennestadt, Germany

Filed Jun. 6, 1977, Ser. No. 803,849

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1976, 2630891

Int. Cl.[2] E21B *11/02*

U.S. Cl. 175—22 **12 Claims**



1. An earth boring assembly comprising hammer means for impacting through an earth formation to form a boring, expander cone means attached rearwardly of said hammer means, drag pipe means axially movably connected to said expander cone means to follow said hammer means into a boring, and clamping means interposed between said expander cone means and said drag pipe means operative to automatically effect frictional locking engagement between said hammer means and said drag pipe means when said expander cone means and said drag pipe means are moved toward each other and to automatically release said frictional engagement when they are moved away from each other.

4,133,396

DRILLING AND CASING LANDING APPARATUS AND METHOD

John E. Tschirky, Long Beach, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

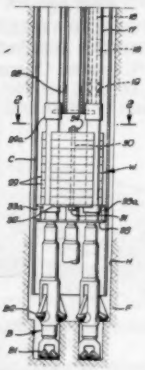
Filed Nov. 4, 1977, Ser. No. 848,468

Int. Cl.[2] E21B *3/12, 9/22*

U.S. Cl. 175—57 **27 Claims**

1. The method of simultaneously drilling and casing a bore hole in earth formation comprising: connecting a pipe string to an in-hole fluid motor drill; nonrotatably releasably connecting

said pipe string to the upper end of a length of casing, said pipe string suspending said casing with said motor drilling extending through the casing and with a drill bit projecting from the lower end of the casing; simultaneously lowering the pipe string and casing by the connection therebetween with the



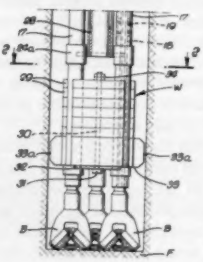
earth formation, while circulating drilling fluid through the pipe string and the motor drill to drive the latter and rotate the bit relative to the casing to progressively form and case the bore hole; and then disconnecting the pipe string from the casing and removing the pipe string and the motor drill from the cased bore hole.

4,133,397

DRILLING WITH MULTIPLE IN-HOLE MOTORS

John E. Tschirky, Long Beach, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Sep. 19, 1977, Ser. No. 834,467
Int. Cl.² E21B *1/06*
U.S. Cl. 175—96 **17 Claims**



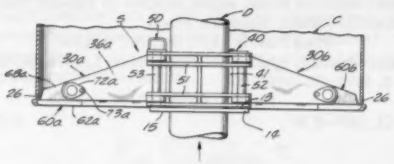
1. In-hole drilling apparatus comprising: a fluid motor assembly having a central support; a plurality of drilling fluid driven motors disposed in circumferentially spaced relation about said support; means for mounting said motors on said support for rotation thereabout; means for connecting said support to a drilling fluid conduit and directing drilling fluid from said conduit to the respective motors; said motors each having a housing structure for conducting drilling fluid therethrough; and a rotary drive shaft having passage means for discharging drilling fluid from said motors; said drive shafts being connectable with a bit to supply said drilling fluid to said bit from said passage means; additional fluid driven motor means between said support and said means for mounting said motors for rotating the motors; and means for conducting additional motor fluid to said additional motor means.

4,133,398

COLLAPSIBLE SPIDER FOR USE IN SUPPORTING CASING DURING UPWARD DRILLING OPERATIONS

Norman H. Still, Brea, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Feb. 28, 1977, Ser. No. 772,458
Int. Cl.² E21B *19/00*
U.S. Cl. 175—171 **8 Claims**



1. In apparatus for drilling and casing an upwardly extending hole, the combination comprising:

a vertically extending drill stem section having at least one circumferential flange near its lower end;

an elongated supporting base extending horizontally and having a laterally opening recess at its longitudinal center, the drill stem being received within said recess and said supporting base resting upon said drill stem flange;

latch means carried by said supporting base and cooperating with said recess to extend about the drill stem for securing said supporting base thereto;

a pair of extension arms secured to respective ends of said supporting base and normally extending horizontally outwardly therefrom, said arms being selectively pivotal upwardly; and

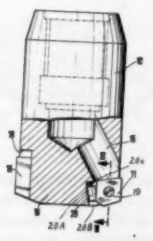
a cylindrical casing section having an inner diameter greater than the length of said supporting base but less than the span of said extension arms, said casing section being disposed substantially concentric to said drill stem section and the lower end thereof normally resting upon said arms.

4,133,399

BORING DEVICE

Lothar Herrmann, Metzingen, Fed. Rep. of Germany, assignor to Wilhelm Hegenscheidt GmbH, Erkelenz, Fed. Rep. of Germany

Filed Dec. 17, 1976, Ser. No. 751,814
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1975, 2556977
Int. Cl.² B23B *51/04*
U.S. Cl. 175—384 **4 Claims**



1. A deep boring device, comprising in combination,

a boring head;

a plurality of cutting inserts individually radially adjustably mounted in said boring head;

each cutting insert having a stepped surface and said boring head has a mating stepped surface, said stepped surfaces of said boring head and cutting inserts meshingly interengag-

ing each other when said cutting inserts are operatively mounted in said boring head; and

at least one axially extending guide plate mounted in said boring head between each pair of adjacent cutting inserts.

4,133,400

SNOWMOBILE

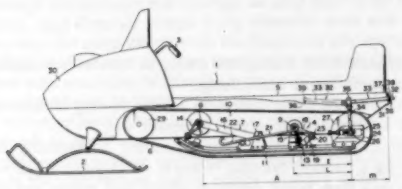
Nobuaki Shiraishi, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Shizuoka, Japan

Filed Nov. 3, 1977, Ser. No. 848,097

Claims priority, application Japan, Nov. 5, 1976, 51-133534; Nov. 5, 1976, 51-149411[U]

Int. Cl.² B62M *27/02*

U.S. Cl. 180—5 R **6 Claims**



1. A snowmobile comprising a vehicle body; a pair of steering skis provided under the front portion of said vehicle body; a suspension mechanism having a pair of slide rails, disposed behind said skis and having its substantially middle portion connected to said vehicle body; a pair of guide wheels rotatably mounted on a guide wheel shaft provided at the rear end of said suspension mechanism; drive wheel means provided at the front portion of said vehicle body; an endless truck assembly stretched between said drive wheel means and guide wheels and extending along lower surfaces of said slide rails; and a torsion mechanism including a U-shaped horizontal torsion member comprising two horizontal arms each having one end connected to the rear end portion of said suspension mechanism and a base having each end secured to the other end of the corresponding arm, said base acting as a torsion bar for substantially equally flexing both the lateral edges of said endless truck assembly when the snowmobile is quickly turned.

4,133,401

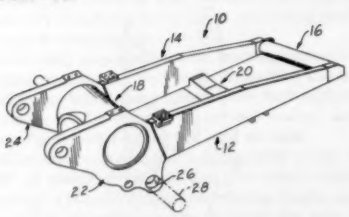
VEHICLE SUSPENSION SYSTEM

Royce D. Allen, East Peoria, and Eldon D. Oestmann, Morton, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 13, 1977, Ser. No. 796,567

Int. Cl.² B62D *55/10*

U.S. Cl. 180—9.5 **7 Claims**



1. A vehicle suspension system comprising:

a unitary frame member including a pair of laterally spaced frame portions each defining an aperture therethrough;

a shaft extending through said apertures,

means providing annular clearances between said shaft and said frame portions whereat said apertures are defined for permitting said shaft to rotate about its longitudinal axis within the apertures and to also move along it longitudinal axis within the apertures whereby said shaft is mounted with freedom of universal movement relative to said frame member; and

a track frame pivotally mounted on each end of the shaft.

4,133,402

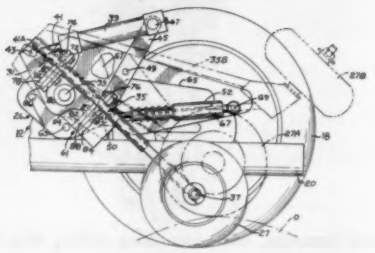
TWO WHEEL MOTORIZED VEHICLE SIDE WHEEL OUTRIGGER ASSEMBLY

Wayne Soo Hoo, 4861 N. Paulina, Chicago, Ill. 60640

Filed Sep. 12, 1977, Ser. No. 832,317

Int. Cl.² B62D *1/12*

U.S. Cl. 180—30 **10 Claims**



1. In a vehicle having frame means rollably supported on a pair of front and rear wheels in line with one another and motive means for propelling the vehicle along the ground, a side wheel outrigger assembly, comprising:

a pair of right and left mounting means attached rigidly to opposite sides of said frame means;

a pair of right and left arms pivotally connected to the respective mounting means;

a pair of right and left struts fixed to the respective ones of said arms extending outwardly and rearwardly therefrom;

a pair of right and left wheel means rotatably mounted on the respective right and left struts;

a pair of right and left piston cylinder assemblies having respective right and left cylinder housings mounted pivotally on the respective ones of said mounting means and having respective right and left piston rods pivotally connected to the respective ones of said arms for latching releasably said arms to connect rigidly and releasably said struts and said wheel means in position, said piston rods having right and left pistons slidably mounted within the respective ones of said cylinders;

right by-pass conduit means connecting in fluid communication the interior of said right cylinder housing between the opposite sides of the right piston disposed therein for enabling said right piston head to move within its cylinder during normal operation of the vehicle to permit in turn the right wheel means to follow freely the contours of the ground over which the vehicle is moving and to absorb impacts encountered by said right wheel means;

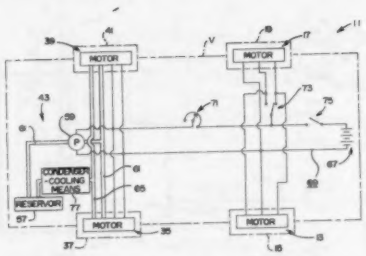
left by-pass conduit means connecting in fluid communication the interior of said left cylinder housing between the opposite sides of the left piston disposed therein for enabling said left piston to move within its cylinder during normal operation of the vehicle to permit in turn the left wheel means to follow freely the contours of the ground over which the vehicle is moving and to absorb impacts encountered by said left wheel means; and

valve means connected in fluid communication with said conduit means for interrupting selectively the fluid communication between opposite sides of a selected one of said right and left cylinder assemblies to prevent the selected arm from moving and for preventing in turn its wheel means and its struts from moving relative to its mounting means.

4,133,403
MEANS FOR PROPELLING A WHEELED VEHICLE

William S. Priddy, Jr., deceased, late of Grenada, Miss., by Betty H. Priddy, administratrix, 116 Rodrick, Grenada, Miss. 38901

Filed Jul. 21, 1975, Ser. No. 597,767
Int. Cl.[2] B60K 7/00
U.S. Cl. 180—65 A 9 Claims



1. Means for propelling a wheeled vehicle, said means comprising:

(a) preliminary drive means for commencing the propulsion of the vehicle; and

(b) main drive means for propelling the vehicle after said preliminary drive means has commenced the propulsion of the vehicle, said main drive means including at least one fluid pressure motor means for driving at least one wheel of the vehicle and including fluid supply means for supplying fluid to said fluid pressure motor means, said fluid pressure motor means including a body member for being fixedly attached to the wheel being driven by said fluid pressure motor means, said body member having a plurality of cylinder portions provided therein, each of said cylinder portions being adapted to selectively receive fluid from said fluid supply means, said fluid pressure motor means including a plurality of piston members with one of said piston members provided in each of said cylinder portions for back and forth movement therein, said fluid pressure motor means including a plurality of heating members with one of said heating members provided adjacent each of said cylinder portions for selectively causing the fluid in each of said cylinder portions to expand thereby causing said piston members to slide back and forth in said cylinder portions, said fluid pressure motor means including a plurality of piston rod members, each of said piston rod members having a first end pivotally attached to one of said piston members and having a second end for being pivotally attached to the frame of the vehicle at a location eccentric of the axle of the wheel being driven by said fluid pressure motor means so that back and forth movement of said piston members in said cylinder portions will cause rotation of the wheel thereby propelling the vehicle.

4,133,404
AUTOMATIC LAWN MOWER

Hugh A. Griffin, Greenfield, Ind., assignor to Agile Systems, Inc., Greenfield, Ind.

Continuation-in-part of Ser. No. 571,587, Apr. 25, 1975, abandoned. This application Aug. 25, 1976, Ser. No. 717,870
Int. Cl.[2] B62D 5/04
U.S. Cl. 180—79.1 30 Claims

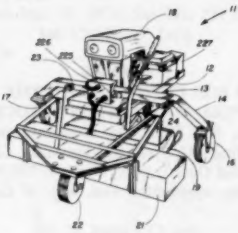
20. Guidance apparatus for a self-propelled mower comprising:

first sensor means positioned to the side of the mower in its normal direction of travel nearest the outer boundary of a mowing area;

second sensor means positioned to the side of the mower in its normal direction of travel farthest from the outer boundary of a mowing area;

multiple detector means within each of said first and second sensor means, said detector means including detectors positioned to monitor an assigned area of vegetation within its path, said detectors positioned in an array whose principal sensing dimension is essentially transverse to the normal direction of travel of the mower, each of said detectors including means for producing a detector output signal dependant upon the vegetation height within its path;

comparator means for producing comparisons of predetermined combinations of said detector output signals and for producing comparator output signals dependent upon said comparisons, said comparator means coupled to said first and second sensor means;



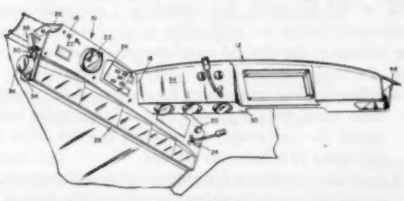
processing means for converting comparator output signals to control signals, said processing means coupled to said first and second sensor means, said processing means including means for providing a status indication signal of the presence of a vegetation height differential within the monitored areas of the detectors within an array, said processing means also including means for providing a location indication signal dependent upon the location of transition of vegetation heights within the monitored areas of said detectors; and

control means for producing guidance signals for a self-propelled mower from the status indication signal and the location indication signal of said processing means.

4,133,405
OVERHEAD INSTRUMENT CONSOLE

Timothy R. Turek, 605 S. Prospect, Redondo Beach, Calif. 90277

Filed Nov. 11, 1977, Ser. No. 850,785
Int. Cl.[2] B60K 35/00
U.S. Cl. 180—90 9 Claims



1. In an automobile having a curved roof structure, a front windshield, a rear window, and a courtesy light support bracket a transverse fore and aft overhead structure for holding and displaying instruments comprising:

a transverse instrument panel having a curved upper edge following the roof curvature of the automobile and located above the front windshield transverse the automobile with the upper edge in close contact with the roof,

a plurality of brackets interconnecting said transverse panel with the roof,

a brace located longitudinally of the automobile in a fore and aft direction and interconnecting the roof in a forward

position near the forward windshield and in the aft position of the roof near the rear window,

a plurality of tapered brackets attached to said brace and adapted to hold fore and aft instrument panels on each side and on the bottommost portion whereby additional instrument panel space is provided in the fore and aft position on both the driver and passenger side, and

said fore and aft instrument panels adapted to mate with the transverse panel at the center thereby providing the appearance of a single uniform structure.

4,133,406

APPARATUS FOR CONTROLLING THE TRAVELING SPEED OF A MOTOR VEHICLE

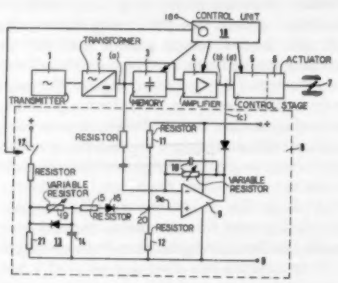
Heinz Allerdist, Bad Homburg, Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Germany

Filed Oct. 7, 1976, Ser. No. 730,453

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1975, 2545294

Int. Cl.² B60K *31/00*

U.S. Cl. 180—105 E **8 Claims**



1. In an apparatus for controlling the traveling speed of a motor vehicle with an electrical control unit acted upon by a speed dependent signal, which unit compares the then present actual speed, by means of the speed dependent signal, with a predetermined desired speed fed into a storage memory unit and upon a deviation of the actual speed from the desired speed transmits a deviation signal which is dependent on the magnitude of the deviation, and including a manually operatively switchable circuit for activating an acceleration operation of the vehicle to the desired speed stored in the storage memory unit, the improvement comprising in combination

a differentiating unit means for receiving the speed dependent signal and for producing a differentiating unit output signal for operatively influencing the deviation signal in the sense of a decrease thereof,

a control stage means for receiving the influenced deviation signal and for influencing the ratio of the fuel-air mixture fed to the motor vehicle and the acceleration depending on the influenced deviation signal,

means for additional time dependent variation of said output signal of said differentiating unit means such that with increasing time from a moment of turning on the circuit, the effect of the differentiating unit means is successively reduced and said output signal of said differentiating unit means changes in a sense of increasing the acceleration of the vehicle, the acceleration limitation being fully effective at the beginning of the acceleration operation, the acceleration limitation being provided only during a certain period of time.

4,133,407

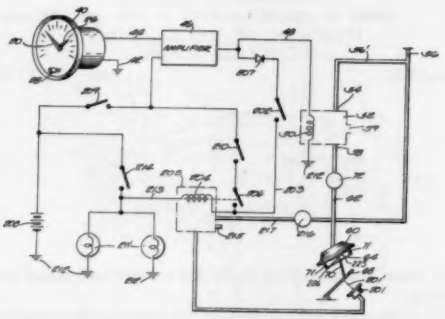
VEHICLE SPEED CONTROLLER

Spencer C. Schantz, 16608 W. Rogers Dr., New Berlin, Wis. 53151

Filed Nov. 11, 1976, Ser. No. 741,086

Int. Cl.² B60K *31/00*

U.S. Cl. 180—108 **13 Claims**



1. A speed controller for use in a vehicle including foot-operated mechanism which is movable in a first direction to increase vehicle speed and movable in second direction opposite to the first direction to decrease vehicle speed, said controller comprising:

a first actuator including a vacuum chamber and diaphragm means mounted in the chamber,

means for coupling said diaphragm to said mechanism,

valve means comprising a housing having a first port for communicating with a source for producing a vacuum that corresponds with vehicle speed, a second port for communicating with said actuator chamber and a third port for communicating with the atmosphere, a valve member operable to control pressure communication between said second and first port and said second and third port, and electrically energizable means for operating said valve member,

means including a first electric contact settable in a stationary position corresponding with the desired speed of the vehicle,

rotatable means that rotate through an angle corresponding substantially with the actual speed of said vehicle,

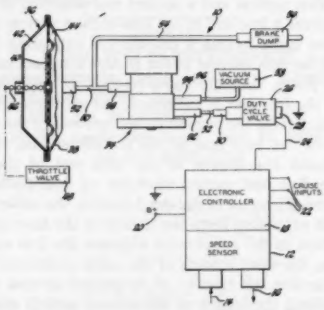
a second electrical contact and a torsion spring connected to said rotatable means and supporting said second contact resiliently on said rotatable means for said second contact to make contact for relatively short intervals and break contact intermittently with said first contact for relatively longer intervals in response to vibrations produced by said vehicle after said rotatable means has rotated through a sufficient angle to enable initial contact between said second and first contacts and for the torsion of said spring to increase in correspondence with said rotatable means rotating through an increasing angle as said vehicle speed increases to thereby cause said contacts to make for relatively longer intervals and break for relatively shorter intervals,

means for coupling said first and second contacts in circuit with said electrically energizable means for operating said valve member to communicate said vacuum pressure from said port with said second port and alternately with said third port in correspondence with the durations of the making and breaking of said contacts to thereby control the force applied by said diaphragm means that tends to move said foot-operated mechanism in said second direction.

4,133,408
FLOW AMPLIFIER VALVE ASSEMBLY

John W. Riddel, Fenton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 27, 1977, Ser. No. 845,881
Int. Cl.[2] B60K *31/00*
U.S. Cl. 180—108 1 Claim



1. In a vehicle road speed control system having a source of vacuum, a vacuum operated power unit acting when energized to control engine speed and power to maintain a desired vehicle road speed, means sensing actual vehicle road speed and desired vehicle road speed and generating a duty cycle signal therefrom, and a duty cycle control valve operated in accordance with said signal to be open to admit atmospheric air therethrough at 0% duty cycle and to be fully closed at 100% duty cycle, the improvement comprising:

an amplifier valve assembly comprising:

an axially extending housing having an opening to atmospheric air at one end, a diaphragm forming a movable wall closing the other housing end, and a divider wall in said housing intermediate said housing ends to divide the housing interior into a diaphragm chamber and a valve chamber;

said divider wall having a first passage therein extending axially of said housing and opening into said chambers at its opposite ends, and a second passage extending transversely of said divider wall and intersecting said first passage;

said housing having a first port connecting said diaphragm chamber and the output side of said duty cycle control valve, a second port connecting said divider wall second passage to said source of vacuum, and a third port connecting said valve chamber to said power unit to selectively provide variable subatmospheric pressure to one side of said power unit;

an amplifier valve in said valve chamber having spring means urging the amplifier valve to close the end of said first passage opening into said valve chamber, said amplifier valve being movable axially of said housing against the force of said spring means to open said first passage end and close said housing atmospheric air opening;

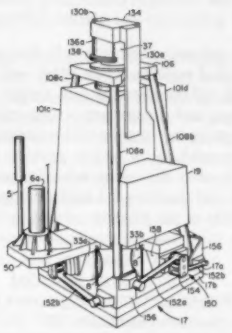
and a drive pin extending through said divider wall first passage with circumferential clearance relative thereto to provide restrictive flow areas between said chambers and said second passage, said drive pin having one end engaging said movable wall and the other end engaging said amplifier valve, said drive pin being movable by said wall against the force of said amplifier valve spring means to force said amplifier valve to open said first passage end opening into said valve chamber;

the initiation of duty cycle operation of said duty cycle control valve in accordance with said signal causing a decrease in absolute pressure in said diaphragm chamber and a pressure differential across said movable wall to move said movable wall and said drive pin to move said amplifier valve to open said first passage one end to said valve chamber and close said housing atmospheric air opening, admitting a decreased absolute pressure from said vacuum source through said second and first passages to said valve chamber and then to said power unit through said third port, actuating said system, said duty cycle control valve controlling the amplifier valve assembly to provide an output to said power unit which is proportional to the output from said duty cycle control valve but at an amplified flow level.

4,133,409
VIBRATOR HOLD-DOWN PLATE

Joseph F. Mifsud, Houston, and John W. Bedenbender, Plano, both of Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Aug. 24, 1976, Ser. No. 717,067
Int. Cl.[2] G01V *1/04*
U.S. Cl. 181—114 6 Claims



5. In a vibratory seismic energy source adapted to be transported on a vehicle, including a reaction mass having a vertically disposed power piston and cylinder assembly formed therein, a baseplate for coupling seismic energy to the ground, means for rigidly coupling the power piston to said baseplate, a pair of substantially vertically disposed support columns comprising piston-cylinder assemblies adapted to support the weight of the transport vehicle thereon, one of said support columns being positioned to each side of said reaction mass, the improvement which comprises a rigid plate interposed between said reaction mass and said baseplate and adapted to permit motion of said means for rigidly coupling said power piston to said baseplate in relation to said rigid plate, said rigid plate extending laterally outward to each side of said reaction mass to enable said support columns to be attached to said rigid plate, and elastic means for supporting said rigid plate from said baseplate in resilient, movable relation therewith.

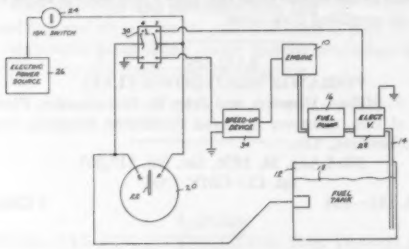
4,133,410
ANTI-THEFT DEVICE FOR VEHICLES

John A. Krusoe, 28852 Oak Grove Dr., Elkhart, Ind. 46514

Filed Nov. 2, 1977, Ser. No. 847,730
Int. Cl.[2] B60R *25/04*
U.S. Cl. 180—114 2 Claims

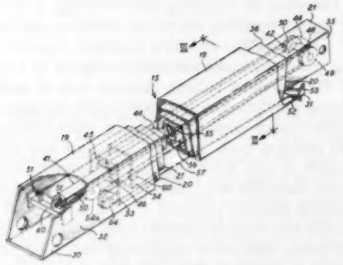
1. An anti-theft device in combination with a motor vehicle having a combustion engine, a tank containing fuel for said engine, a fuel line connecting said engine to said tank, means for drawing fuel from said tank and delivering the fuel to said engine to cause the operation of the engine, a fuel gauge associated with said tank for indicating the amount of fuel therein, an electrical power source, said power source connected by an ignition switch to said fuel gauge, said fuel gauge having an indicator means shiftable between full and empty positions for indicating the amount of fuel in said tank when said gauge is energized by said power source, said ignition switch having an on position causing said fuel gauge to be energized and an off position, said anti-theft device comprising a valve connected to said fuel line between said engine and fuel tank, said valve having a normal closed position isolating said tank from said

engine, a switch member carried by said vehicle in a hidden location having first and second operative positions, said valve being operatively connected to said power source through said ignition switch and switch member, said valve being shifted into an open position when said ignition switch is shifted into



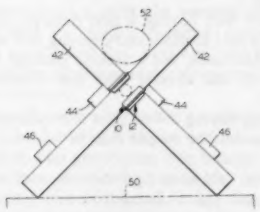
its on position and said member is in its first position, said valve being in its closed position when either said ignition switch is shifted into its off position or said switch member is in its second position, and means associating said switch member with said fuel gauge for causing said indicator means of the fuel gauge to be located in its empty position when said switch member is in its second position whereby said fuel tank will be isolated from said engine and said fuel gauge will indicate empty regardless of the position of said ignition switch.

4,133,411
EXTENSIBLE BOOM
Walter R. Curb, Dinuba, Calif., assignor to Chamberlain Manufacturing Corporation, Elmhurst, Ill.
Filed Feb. 11, 1977, Ser. No. 767,828
Int. Cl.² B66F *11/04*
U.S. Cl. 182—2 **7 Claims**



4. A telescoping platform assembly comprising a vehicle base, a boom mount rotatably fixed to said base and rotatable in substantially a horizontal plane, a boom carried by said boom base, said boom having a base end pivoted to said boom base and a free end remote from said pivot, means for elevating the free end with respect to the boom base around said pivot, said boom comprising three nestled together substantially rectangular cross section boom sections, a first of said sections having a base therein attached to said pivot, a second of said sections telescoped within said first section and a third of said sections telescoped within said second section, said third of said sections having a free end remote from the base end of said first section, a platform attached to said free end of said third section, a hydraulic cylinder having a base end attached to the first section adjacent the based end of the first section, said hydraulic cylinder including an extensible piston rod having a free end remote from said base end of said hydraulic cylinder, said hydraulic cylinder partially nestled within said third section, a rigid hollow rectangular cross section member having a first end fixedly attached to said free end of said piston rod, said rigid member positioned interiorly of said third section and relatively movable with respect thereto, said rigid member having a second end remote from said free end of said piston rod projecting beyond a base end of the third section opposite the free end of said third section, said rigid member second end of said rigid member, a sheave attached to said free end of said piston rod, a second sheave attached to said base end of said section whereby the first and second sheaves are spaced apart a fixed distance, a cable having a first end attached to the first section adjacent the base end of the first section and a second end attached to the first section adjacent a free end of the first section remote from the base end, the cable having a first stretch extending from the base end of the first section to the sheave attached to the free end of the piston rod, the cable passing around the sheave attached to the free end of the piston rod and having a second stretch passing from the sheave at the free end of the piston to the sheave at the base end of the second section, the cable passing around the sheave at the base end of the second section, the first and second stretches of said cable having portions thereof interior of the third section, the cable having a third stretch extending from the sheave at the base end of the second section to the attachment adjacent the free end of the first section, the third stretch of the cable positioned interior of the first section and exterior of the second section, the cable at a point along the length of the second stretch attached to the third section adjacent the base end of the third section whereby movement of the second section with respect to the first section caused by telescoping of the piston rod in the pneumatic cylinder will cause relative movement of the cable within the second stretch thereby causing movememnt of the third section with respect to the first and second sections.

4,133,412
SAW BUCK BRACKET AND SAW BUCK ASSEMBLY EMPLOYING SAME
William J. Hildebrandt, West Simsbury, Conn., assignor to The Stanley Works, New Britain, Conn.
Filed Dec. 12, 1977, Ser. No. 859,290
Int. Cl.² F16M *11/00*
U.S. Cl. 182—154 **15 Claims**



1. A saw buck bracket comprising

A. a pair of bracket elements each having:

1. a web portion, the bracket elements having their web portion disposed in abutting surface contact;
2. parallel sidewall portions extending perpendicularly to the web portion along two opposite sides thereof, the sidewall portions of the two bracket elements being generally aligned in the closed position of the bracket,

said web portions of said bracket elements each having an arcuate slot therein, the chord of said slot extending perpendicularly to said sidewall portions, the slots of the bracket elements being disposed adjacent opposite ends of the sidewall portions so that the arcs extend towards each other, said web portions also having axially aligned circular apertures centrally thereof, one bracket web portion having a circular aperture of lesser diameter than the circular aperture of the other web portion and further having an axially extending lip of circular cross section formed about the aperture therein and extending through the aperture of the other bracket web portion, said lip having a collar on the free end thereof extending along the surface of said other bracket web portion opposite that abutting said one bracket web portion; and

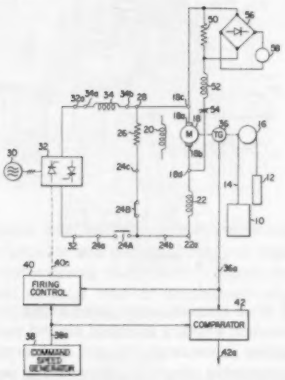
B. a pair of fastener means, each fastener means being fixedly seated in one of the bracket web portions and having a shank portion extending through the arcuate slot of the other bracket web portion and slidable therein, said fastener means each having an end portion larger than the width of the cooperating slot so as to bear upon the surface of the web portion about the slot and thereby retain the bracket elements in assembly.

4,133,413

ELEVATOR SAFETY DEVICE

Eiki Watanabe, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 25, 1977, Ser. No. 818,929
Claims priority, application Japan, Aug. 31, 1976, 51-103863
Int. Cl.² B66B *5/02*
U.S. Cl. 187—29 R **5 Claims**



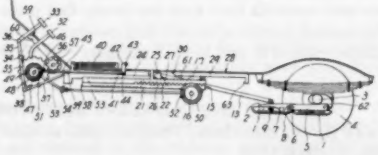
1. An elevator safety device comprising an elevator car, a source of alternating current, a controlled semiconductor converter connected to said source of alternating current a reversible electric motor controllably driven by said source through said controlled semiconductor converter to travel said elevator car, a ripple sensor circuit operative with a ripple current produced by said semiconductor converter and inoperative in response to the disappearance of said ripple current, and an emergency braking circuit for urgently braking said electric motor in response to said ripple sensor circuit being brought into its inoperative state.

4,133,414

DEVICE FOR EMERGENCY BRAKING AND PREVENTING AN AUTOMOBILE FROM SLIPPING SIDEWAYS

Fukuzo Ushitani, 209, Miyanoshita, Higashioshima, Amagasaki-shi Hyogo-ken, Japan

Filed May 23, 1977, Ser. No. 799,317
Int. Cl.² B60T *1/14*
U.S. Cl. 188—5 **12 Claims**



1. A device for braking an automobile, said device comprising:

ski-type braking means mounted on the axle between the rear wheels of said automobile for contacting the pavement beneath said automobile and for preventing said automobile from slipping sideways;

rod and gear means connected to said braking means for raising and lowering said braking means toward and away from said pavement;

motor means operatively connected to said rod and gear means for operating said rod and gear means, whereby operating said motor means causes said rod and gear means to raise and lower said braking means;

pedal means attached through the floor board of said automobile and operatively connected to said rod and gear means for moving said rod and gear means and for starting the operation of said motor means in response to the movement thereof; and

said rod and gear means is comprised of:

an ascending and descending rod connected to one end to said braking means, said ascending and descending rod having a rack on the end thereof opposite said braking means;

rotatable elevating gear means engaging said rack on said ascending and descending rod for raising and lowering said rod;

bevel gear means coaxial with said elevating gear means at one end thereof for rotating said elevating gear means;

motor gear means coaxial with the end of said bevel gear means opposite the end of said bevel gear means connected to said elevating gear means for rotating in conjunction with the operation of said motor means and for rotating said coaxially mounted bevel gear means, said motor gear means having at least one ratchet wheel coaxial with said bevel gear means;

pawl means adjacent said ratchet wheel for engaging said ratchet wheel and locking the rotations of said motor gear means;

pivotable cam means connected to the end of said pawl means opposite the end of said pawl means engaging said ratchet wheel for pivoting and forcing said pawl means toward and away from said ratchet wheel;

a traveling rod having at least one geared rack on the underside thereof above and engagable with said elevating gear means and movable thereby;

a spring-biased pressed rod mounted beneath the floor board of said automobile above said traveling rod, connected at one end to said pedal means and movable therewith, and adjacent and engagable with said pivotable cam means, whereby depressing said pedal means causes said pressing rod to move against the bias of said spring, pivot said cam means, and withdraw said pawl means from said ratchet wheel; and

a pivotable pressing piece connected to the end of said pressing rod opposite the end connected to said pedal means and engagable with said traveling rod.

4,133,415

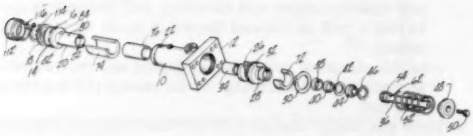
LINEAR FORCE SHOCK ABSORBER

Richard G. Dressell, Jr., 14609 Stonehouse, Livonia, Mich. 48154, and Robert J. Heideman, 37780 Westwood Cir., Apt. 101, Westland, Mich. 48185

Division of Ser. No. 681,287, Apr. 28, 1976, Pat. No. 4,059,175, which is a continuation-in-part of Ser. No. 574,885, May 6, 1975, abandoned. This application Feb. 23, 1977, Ser. No. 771,415
Int. Cl.² F16F *9/48*
U.S. Cl. 188—285 **1 Claim**

1. A fluid shock absorber for providing a constant decelerating force to a moving member, comprising: an outer tube; a bearing retainer rotatably supported within one end of the tube; a piston rod slidable axially within the tube on said bearing retainer; a piston supported on the rod within the tube; a piston ring extending about the outer diameter of the piston; an inner cylinder rotatably supported at the other end of the tube; an outer sleeve surrounding said cylinder and rotatably fixed within said tube; apertures formed in the cylinder and the sleeve operative to form fluid orifices connecting the interior of the cylinder to the exterior of the sleeve, the apertures being so arranged that the rotational position of the sleeve relative to

the cylinder controls the configuration of the orifices; eccentric engaging means formed on the adjacent ends of the bearing retainer and the inner cylinder operative to lock the two in rotational alignment with one another with respect to the tube; said eccentric engaging means comprising a pair of asymmetric tabs extending endwise from two circumferentially spaced points on the end of the cylinder which abuts the bearing retainer, said tabs being displaced on the same side of a diametric line across said cylinder to provide said asymmetry, said



tabs having inner surfaces in alignment with the inside diameter of said cylinder to provide a guide surface to guide said piston and piston ring into said cylinder at assembly; removable adjustment means attachable to the cylinder and bearing retainer assembly for adjusting the rotational position of the cylinder relative to the sleeve to control the sizes of the orifices through the sleeve and the cylinder; and releasable fastener means extending through the tube for locking the cylinder and the bearing retainer in an adjusted rotational position relative to the tube.

4,133,416

ELECTRIC CORD WINDER

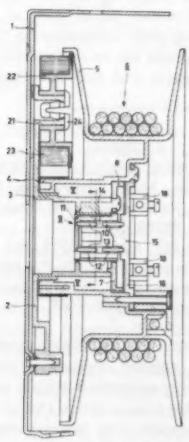
Johannis M. Deurloo, Emmen, Netherlands, assignor to Draka Kabel B.V., Amsterdam, Netherlands

Filed Mar. 2, 1977, Ser. No. 773,614

Claims priority, application Netherlands, Mar. 12, 1976, 7602589

Int. Cl.[2] H02G *11/02*

U.S. Cl. 191—12.2 R **1 Claim**



1. An electrical cord winder, which comprises a frame, a hollow journal mounted at one end on said frame, a drum for winding the electric cord, said drum being rotatably journalled on the hollow journal, a spring tensioned between the drum and the frame for automatically winding the cord on the drum, a plate, means for mounting the plate on the other end of the hollow journal to retain the drum in its axial direction, and electrical contact elements provided for connection to the cord, said contact elements comprising at least two roller bearings enclosed in a housing non-rotatably disposed in the hollow journal and mounted in the hollow journal from the other end of said journal.

4,133,417

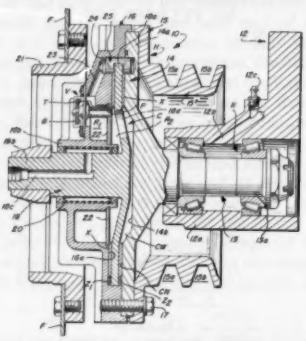
FLUID DRIVE COUPLING

Richard E. Glasson, and Jerre F. Lauterbach, both of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Dec. 23, 1977, Ser. No. 863,995

Int. Cl.[2] F16D *35/00*

U.S. Cl. 192—58 B **10 Claims**



1. A fluid drive coupling comprising a rotary mounted plate-like first member; a rotary mounted second member provided with a chamber accommodating said first member, said members being rotatable about a common axis and one of said members being adapted to have an external driving force applied thereto, said chamber including an annular fluid drive section having surfaces thereof in close proximity to substantial outer opposite surface portions of said first member, and an inner section having surfaces thereof spaced axially a substantial distance from opposite sides of said first member, the inner section of said chamber disposed axially to one side of said first member being formed into first and second fluid reservoirs interconnected to one another only through a port; a thermal responsive valve mounted on said second member and rotatable therewith, said valve being operatively connected to said port and effecting opening thereof when said valve is subjected to predetermined temperatures; and elongated fluid skimming means mounted for slidable axial movement within an elongated cavity formed in said second member, said cavity having a first portion in communication with a predetermined peripheral segment of said chamber drive section and a second portion in communication with said first reservoir, said skimming means having a segment thereof protruding into said chamber drive section and encompassing a peripheral portion of said first member, said skimming means being adapted to slidably engage opposing surfaces of said first member peripheral portion to remove fluid carried on the surfaces thereof and to divert said removed fluid from the cavity first portion to said cavity second portion when said first member is rotating in one direction relative to said second member.

4,133,418

THROUGH THE FLOWLINE SELECTOR

Bernard H. Van Bilderbeek, Ventura, Calif., assignor to Vetco, Inc., Ventura, Calif.

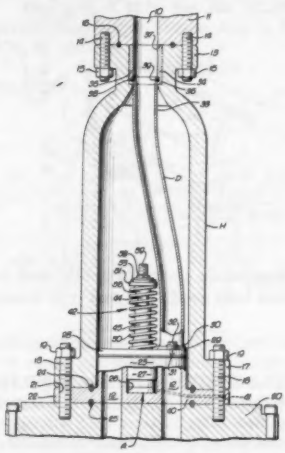
Filed Jul. 8, 1977, Ser. No. 814,104

Int. Cl.[2] B65G *11/20*; E21B *41/00*

U.S. Cl. 193—23 **27 Claims**

1. In through the flowline selector apparatus for selectively establishing communication between a single port and one of a plurality of flowlines: an elongated housing having a passage at

one end, a port member at the other end of said housing and having a plurality of flowline ports spaced angularly, a diverter tube extending between said passage and said port member and rotatable and reciprocable with respect to said passage to be



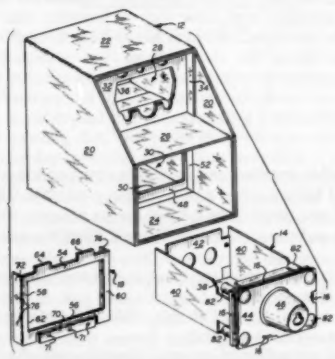
selectively aligned with said flowline ports, actuator means operable to reciprocate said diverter tube, and means responsive to and operable during reciprocation of said diverter tube for rotating said diverter tube to successively align said diverter tube with said flowline ports.

4,133,419

MONEY BOX SUPPORT ARRANGEMENT

Harry Greenwald, Whitestone, and Salvatore Iglio, Richmond Hills, both of N.Y., assignors to Walter Kidde & Company, Inc., Clifton, N.J.

Filed Oct. 4, 1977, Ser. No. 839,388
Int. Cl.[2] G07F 9/06
U.S. Cl. 194—1 B **4 Claims**



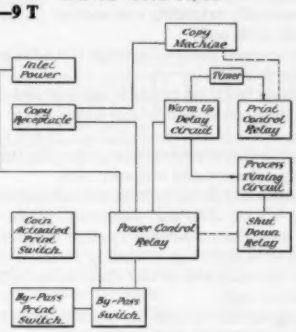
1. In combination with a housing for receiving a lockable money box of the type having transversely extendable locking bolts, a money box support arrangement which comprises a wall on said housing having an opening into which the money box is inserted, a frame positioned within said housing behind said wall and secured to the housing, said frame having an opening accommodating the insertion therethrough of the money box and flanges spaced with respect to said wall to define therewith channels that receive and confine the locking bolts of the money box to secure same against further inward movement, and against further outward movement relative to the housing.

4,133,420

COIN OPERATED COIN DEVICE FOR A COPY MACHINE

John W. McManus, Smithtown, N.Y., assignor to Copylite, Inc., Fort Lauderdale, Fla.

Filed Jul. 15, 1977, Ser. No. 815,817
Int. Cl.[2] G07F 17/00
U.S. Cl. 194—9 T **4 Claims**



1. A control device for converting a conventional, electrostatic or bond copy machine from a manual print operation to a two-mode device for both coin operation or manual operation, the device comprising:

an inlet power source;

an electrical plug receptacle for receiving an inlet power line of the conventional copy machine;

a coin actuated switch connected to the inlet power source;

a power control relay coupled to said coin actuated switch;

a print signal actuating circuit connected to a print actuating control switch of the conventional copy machine;

time delay circuit means connected between said power control relay and said copy machine print actuating control switch for delaying a signal from the power relay to the print actuating control switch of the conventional copy machine; and

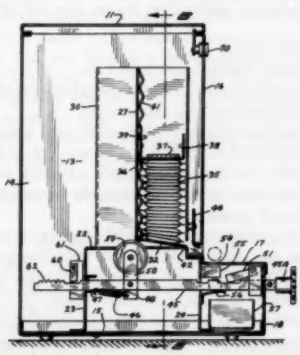
a shut down relay connected to said time delay means and said power control relay for shutting off said power control relay after a predetermined amount of time.

4,133,421

COIN OPERATED PACKET DISPENSING MACHINE

James O. Hanley, 12838 Burwell Dr., Minnetonka, Minn. 55343, and Irving F. Snyder, 663-91st Ave., NE., Blaine, Minn. 55434

Filed Mar. 3, 1977, Ser. No. 773,803
Int. Cl.[2] B65H 3/06; G07F 11/20
U.S. Cl. 194—57 **6 Claims**



1. A coin-operated machine for dispensing generally flat

semi-rigid packets of irregular contour, which machine comprises:

(A) a housing,

(B) at least one vertically disposed column packet magazine disposed within said housing for holding a plurality of packets in stacked relation for gravity feed operation, said magazine including:

(1) a vertically extending saw-toothed packet guide on the inside back wall,

(2) a horizontal packet discharge slot adjacent the bottom thereof, and

(3) bottom walls on opposite sides of said slot extending angularly downwardly and forwardly to the discharge slot,

(C) a complementary horizontal packet discharge slot in said housing adjacent said magazine slot,

(D) a central slot in the bottom wall of said magazine and a spring biased slide bar supported within said housing under said central slot for relative reciprocal movement from a retracted to an extending position, the upper edge of the rearward end of said slide bar including a plurality of ratchet teeth,

(E) handle means on said bar external of said housing for reciprocating said bar,

(F) a coin deposit slot in said housing overlying said slide bar,

(G) a vertically disposed coin-receiving slot extending through the slide bar and underlying said coin deposit slot,

(H) a fixed coin support underlying said coin-receiving slot when said slide bar is in retracted position,

(I) a recess in the upper edge of said slide bar adjacent said coin-receiving slot,

(J) a first locking pawl pivotally supported within said housing, said pawl being engageable with said recess upon reciprocation of the slide bar with no coin in the coin-receiving slot, and a further locking pawl pivotally supported within said housing immediately forwardly of said ratchet teeth when said slide bar is in retracted position, said pawl being engageable with said ratchet teeth upon less than full stroke reciprocation of said slide bar, and

(K) friction means movable with said slide bar under said magazine in a path extending into the central slot in the bottom end of the magazine for frictional engagement with the lowermost packet in the magazine to remove that packet through the discharge slot.

4,133,422

TYPING MACHINE

Takeo Suzuki; Ikutaro Inoue; Hideo Tamai, and Masatsugu Aoki, all of Soma, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Aug. 13, 1976, Ser. No. 714,094

Claims priority, application Japan, Aug. 14, 1975, 50-98802

Int. Cl.[2] B41J *1/32*

U.S. Cl. 400—154.5 **9 Claims**

1. A typing machine comprised of:

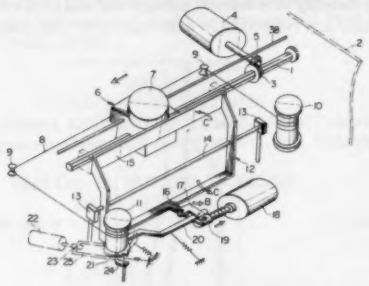
a type wheel which is movable laterally across a line of type;

means for rotating said type wheel;

a hammer head means with an elongated hammer head, said hammer head extending across said line of type and being laterally non-movable; a shaft rotatably supporting said hammer head means for pivotable movement of said hammer head means;

electromagnetic relay means connected to said hammer head means and comprising a single electromagnetic relay and which upon actuation advances the type wheel laterally and moves said hammer head means;

said hammer head means being connected to said electromagnetic relay moving means such that when said moving means moves in one direction said hammer head means pivots about said shaft and said hammer head strikes toward said type wheel, and when said electromagnetic relay moves in the opposite direction said moving means causes the lateral advance of said type wheel and said



hammer head means pivots about said shaft and removes said hammer head away from said type wheel.

4,133,423

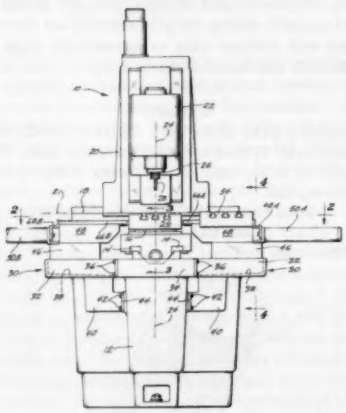
SHUTTLE SYSTEM FOR MACHINE TOOL

Frank Zankl, Milwaukee, Wis., assignor to Kearney & Trecker Corporation, West Allis, Wis.

Filed Oct. 21, 1977, Ser. No. 844,206

Int. Cl.[2] B65G *47/00*

U.S. Cl. 198—339 **8 Claims**



1. A pallet shuttling unit for use in combination with a machine tool having a bed and having a worktable mounted on said bed, said worktable having means thereon for slidably receiving and supporting a pallet, said shuttling unit comprising:

a pair of shuttle tables mounted on said bed on opposite sides of said worktable;

means on each of said shuttle tables for slidably receiving and supporting a pallet;

a tunnel extending all the way through each of said pallets;

a pair of hydraulic rams each mounted on a corresponding one of said shuttle tables;

each hydraulic ram having a piston and an elongated piston rod attached to said piston;

each piston rod being movable between an extended and a retracted position in response to movement of the corresponding piston; and

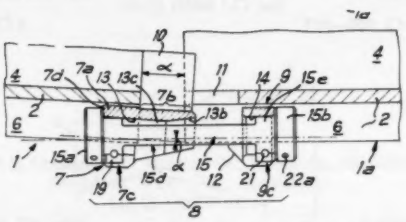
each piston rod being long enough to extend completely through said tunnel in an adjacent pallet in the extended position of said piston rod so that the end of said piston rod can bear against a pallet on said worktable to push said pallet off of said worktable when said piston rod is extended.

4,133,424

CONNECTING MEMBERS FOR THE ENDS OF TUBS OF A SCRAPER CONVEYOR

Jean Sabes, Anzin, France, assignor to Societe Anonyme dite: J. Sabes & Cli, Anzin, France

Filed Aug. 5, 1976, Ser. No. 712,059
Claims priority, application France, Aug. 6, 1975, 75 24547; Feb. 13, 1976, 76 04037
Int. Cl.[2] B65G 19/18
U.S. Cl. 198—735 10 Claims



1. A coupling device between two adjacent tubs of a scraper conveyor for mines, in which each tub includes two side members arranged symmetrically relative to the median vertical plane of the tub and having an inverted M shaped section and a median horizontal plate connecting the two median portions of two side members, said coupling device comprising:

a male connecting member fixed to one end of each side member of one of said two adjacent tubs,

a female connecting member fixed to the other end of each side member of the other of said two adjacent tubs, and

a connecting rod provided with two terminal retaining flanges having shoulders,

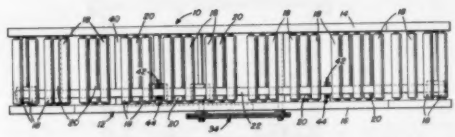
said male connecting member having a transverse supporting partition and a projecting portion which extends parallel to the side member beyond the end of the corresponding tub, said female connecting member defining a connecting cavity able to receive the projecting portion of said male connecting member and including a transverse supporting partition recessed to the end of the corresponding tub whose length is the same as that of the projecting portion, each of said male and female connecting members includes a locating slot which extends parallel to the corresponding side member and which serves to receive said connecting rod with two terminal retaining flanges, whose shoulders can cooperate with one of said supporting partitions, each of said male and female connecting members includes a lateral access opening extending parallel to the said locating slot and issuing laterally from the outside of said side member and the corresponding connecting member into said locating slot, said supporting partition of each connecting member includes a rear face providing a supporting face for one of the retaining flanges and the supporting partition of the male connecting member is constituted by the rear end of the projecting portion, the width of said lateral access opening is less than the maximum dimension of the corresponding locating slot cross-section whereby the junction zones between the lateral access opening and the locating slot constitute a lateral locking means for said connecting rod relative to the corresponding supporting partition, each connecting member having a profiled section defining a groove whose cross-section is identical to the cross-section of the median V-shaped portion of a side member having an inverted M shape, each supporting partition having a planar lateral face located in the same plane as the planar lateral face of the corresponding connecting member and, after fitting the latter in the corresponding side member, also located in the same plane as the lateral face of the latter, the supporting partition of each connecting member formed in one piece with a V-shaped section of the corresponding connecting member and extends over the entire cross-section of the groove of said profile section, and the supporting partition of the male connecting member serves as a connecting body, between the rear end of the projecting portion and the front end of the profiled sections of the said male connecting member.

4,133,425

ACCUMULATING CONVEYOR

Gary A. Roach, Trumann, Ark., assignor to Roach Manufacturing Corporation, Trumann, Ark.

Continuation of Ser. No. 421,224, Dec. 3, 1973, abandoned. This application Jun. 18, 1975, Ser. No. 587,907
Int. Cl.[2] B65G 13/06
U.S. Cl. 198—781 2 Claims



1. An accumulating conveyor, comprising, in combination:

(a) a frame including a pair of spaced, parallel, longitudinal side rails in the form of channels each having a web and a pair of codirectional flanges extending from the web;

(b) a plurality of carrier rollers rotatably mounted on and extending between the rails;

(c) a plurality of pressure rollers rotatably mounted on and extending between the rails and arranged adjacent and below the carrier rollers for movement toward and away from same;

(d) a single, continuous, flat driving belt arranged adjacent and contacting all of the rollers; and

(e) means for adjustably biasing one end of the pressure rollers toward the carrier rollers and varying the driving force exerted on the belt, the other ends of the pressure rollers being vertically fixed, the means for adjustably biasing including a plurality of longitudinally extending, codirectional members each mounted on a lower one of the flanges of one of the rails by a double-nut arrangement for individual adjustment parallel to the longitudinal extent of the member, a plurality of channel brackets arranged on the members, with each member having a separate bracket thereon, each bracket having legs provided with apertures, the members slidably disposed in the apertures, each pressure roller having a shaft extending through an associated slot provided in the web of the rail and mounted on the bracket, and a compression spring adjustably arranged on the member between the rail and the bracket for biasing each pressure roller toward the belt and carrier rollers, each member having a further nut threadingly, adjustably mounted on the member abutting the lower end of the spring for adjusting the bias exerted on the pressure rollers, said driving belt being arranged with a run extending between a plane in which the carrier rollers are arranged and a plane in which the pressure rollers are arranged for being biased against the carrier rollers by the pressure rollers and imparting rotary motion to the carrier rollers, said belt being oriented adjacent the end of the pressure rollers which are adjustably supported from the rail and having a width at least equal to the diameter of the carrier rollers and on the order of 1 to 3", but substantially less than the length thereof, being relatively thin on the order of ¼", and constructed of polyvinyl chloride material having a stretch of approximately ½% of its over-all length.

4,133,426

HYDRIDE CONTAINER

Pierre P. Turillon, Ramsey, and Gary D. Sandrock, Ringwood, both of N.J., assignors to The International Nickel Company, Inc., New York, N.Y.

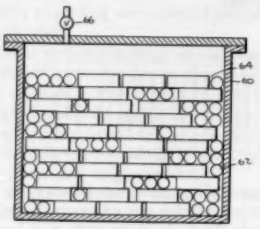
Filed Feb. 24, 1978, Ser. No. 880,959
Int. Cl.[2] B65D 25/00; F17C 11/00; C01B 1/26; F16L 55/04
U.S. Cl. 206—0.7 5 Claims

1. A gas-containing means comprising

(a) pressure resistant vessel having a valved port,

(b) a plurality of closed containers positioned within said vessel, each container having

(1) a wall structure enclosing a definite volume but deformable at pressures below the rupture pressure of said pressure resistant vessel at least part of said wall structure being permeable to said gas and impermeable to solid particles;



(2) a multiplicity of solid, gas absorbing particles within said wall structure occupying, when in the gas-free state, substantially less than the total volume of said container, and, when in the gas-charged state, no greater than the total volume of the container; and

(c) a continuity of gas passages between and among said containers communicating with said valved port.

4,133,427

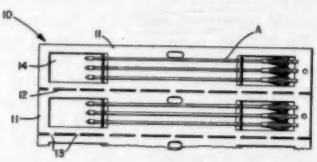
ARROW PACKAGE

Thomas H. Loomis, Box 445, Martin, S. Dak. 57551

Filed Sep. 29, 1977, Ser. No. 837,874

Int. Cl.[2] B65D *85/20*

U.S. Cl. 206—317 **2 Claims**



1. A package of a plurality of arrows, each of said arrows having a pointed tip at one end forming a shoulder at its junction with the body of said arrow, a string notch at the other end, and feathers adjacent said other end, said package comprising a stiff, flat sheet having a plurality of longitudinal, corrugated board panels joined along longitudinal edges by weakened separation lines formed by spaced tabs connecting the adjacent panels, each panel having large rectangular openings adjacent its opposite ends with transverse outer edges adjacent the ends of said panel, transverse flaps along the opposite inner ends of said openings formed by severing their ends from said panel and connected to said panel by weakened, transverse lines to form integral hinged connections for raising said flaps at an angle to said panel, said flaps having a plurality of potential apertures aligned along longitudinal lines of said panel spaced inwardly from the edges of said flaps, each potential aperture being formed by cuts through said flap, intersecting at a point at the center of said potential aperture, said flaps being raised at an angle to said panel, said arrows passing through said aligned apertures of said flaps by forcing their pointed tips substantially perpendicularly to the flaps through the cuts forming the apertures with their cut edges engaging said arrows, said shoulders on said tips of said arrows resisting removal of said arrows through said apertures, the string notches on the other ends of said arrows fitting over the outer edge of the rectangular opening adjacent the end of the panel, said raised flaps with the arrows in position protecting the feathers from being flattened when packages with the arrows are stacked, said panels being readily separated along the separation lines by rupturing said tabs, thereby forming a plurality of packages of lesser numbers of arrows.

4,133,428

SURROUNDING CARTON FOR TRANSPORTING CONTAINERS

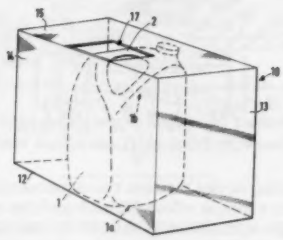
Wolfgang Glöyer, Wiesenweg 51, D-2000 Oststeinbek, Germany

Filed Nov. 23, 1977, Ser. No. 854,231

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1976, 7637703[U]

Int. Cl.[2] B65D *25/22*

U.S. Cl. 206—427 **2 Claims**



1. A packaging unit comprising a plurality of containers in odd numbers, said containers being of the same size and shape, each said container having a bottom, a top and sides extending between said bottom and top, each container including a handle located at least in part on said top thereof, a carton having a rectangular parallelepiped shape and comprising a base, two pair of oppositely disposed side walls secured to and extending upwardly from said base and a cover secured to said side walls, one pair of said side walls being longer than the other pair, said base, side walls and cover defining a closed space for receiving the odd numbers of said containers which are arranged therein in side-by-side relation substantially filling the cross sectional area of the space in said carton parallel with said base thereof and with the bottoms of said containers supported on the base of said carton and with said tops thereof facing upwardly toward and adjacent said cover of said carton, said cover of said carton having an opening therethrough spaced centrally between the shorter of said side walls and the middle one of said containers within said carton having the handle thereon aligned with the opening in said cover and the size of the opening being sufficient to permit a person to to place his hand through said cover to grip said handle aligned therewith for picking up said carton.

4,133,429

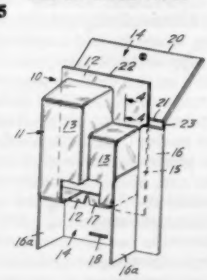
PACKAGE STRUCTURE

Morris W. Kuchenbecker, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.

Filed May 10, 1978, Ser. No. 904,375

Int. Cl.[2] B65D *73/00*

U.S. Cl. 206—465 **5 Claims**



1. A reclosable blister card package, comprising: a plastic blister having a flanged portion and a raised product holding portion; a paperboard card releasably affixed to a first part of

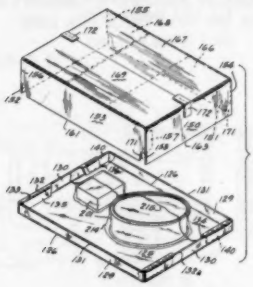
said flanged portion; a portion of said card folded over to present an edge thereof in engagement with a second part of said flanged portion of said blister; and said card being bendable along a line extending in substantially parallel relationship to said edge of said folded portion so as to accommodate pivotation of said edge out of engagement with said second part of said flanged portion, and consequent release of said card from said blister in provision of access to the interior of said blister.

4,133,430

CARTONIZED TRAY

Harold E. Cravens, 6521 Winston Dr., Woodridge, Ill. 60515

Filed Nov. 7, 1977, Ser. No. 849,339
Int. Cl.[2] B65D *65/14*
U.S. Cl. 206—497 **8 Claims**



1. A cartonized tray comprising:

a tray comprising

a bottom panel of rectangular shape having opposite side and end edges and an upper surface,

upstanding side and end walls engaged with one another adjacent corners of the bottom panel and engaged with the panel at the edges thereof, and

a discrete coating of a bonding agent on the inner surfaces of the walls and the upper surface of the panel to make such surfaces adherent to a plastic film; and

a cover comprising

a top panel structure similar in assembled size and shape to the bottom panel and having corresponding side and end edges,

downturned side and end walls engaged with one another at corners of the top panel and with the top panel at fold lines at the side and end edges thereof,

the side walls terminating in bottom edges thereof which are parallel to the top panel and at equal distances therefrom, and

surfaces forming a notch in each of the side walls through the bottom edges thereof adjoining each end wall, each notch being of a height at least equal to that of the side walls of the tray adjacent the end walls thereof, the notches passing the walls of the tray therethrough without substantial distortion thereof and the tray receiving the side walls of the cover against the bottom panel thereof in abutting relation,

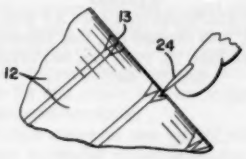
whereby miscellaneous items received in the tray may be bonded to the tray by an overlying heat-shrinkable plastic film applied to said coating surfaces of the tray and then enclosed for shipping within the walls and spaced top panel of the cover.

4,133,431

PACKAGING OF TABLETS

Charles F. Fischer, Jersey City, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 746,817, Dec. 2, 1976, abandoned. This application Feb. 7, 1978, Ser. No. 875,795
Int. Cl.[2] B65D *65/26, 83/04*
U.S. Cl. 206—532 **7 Claims**



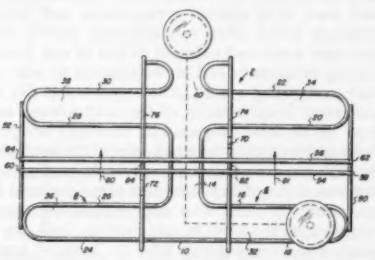
1. In a package wherein a stack of brittle tablets is contained in a shrink wrap enclosure, said tablets being of such fragile structure as to be susceptible to fracture or disintegration during normal packaging and transportation, the improvement wherein relatively thin stiff separator elements in substantially full surface engagement with adjacent tablets are disposed between groups of tablets in the stack and in contact with the tablets at the ends of the stack, each of said separator elements being a smooth sided disc of synthetic plastic materially thinner than a tablet, and each of said separator elements being peripherally formed with means for indicating package opening zones between successive groups of tablets and for facilitating severing of the package at those zones.

4,133,432

GOBLET-TYPE RECEPTACLE HOLDER

William E. Den Blaker, 23930 Ocean Ave., Torrance, Calif. 90505

Filed Oct. 4, 1976, Ser. No. 729,851
Int. Cl.[2] A47G *29/00*
U.S. Cl. 211—71 **1 Claim**



1. A rack for supporting wide-based, stemmed receptacles in a pendant position comprising:

at least two pairs of receptacle-supporting channels of a fixed extent, each of said receptacle-supporting channels being defined by a pair of elongated rigid members having a substantially uniform spacing therebetween, said pairs of rigid members being positioned in a common plane and extending in a common direction in said common plane,

a pair of elongated, rigid rack-supporting members, each of said pair of rack-supporting members being comprised of a substantially straight major portion lying in a plane parallel to said common plane and a pair of minor portions extending in a plane substantially perpendicular to said common plane, said minor portions of said rack-supporting members being rigidly coupled to said receptacle-supporting channels at opposite ends thereof, said major portions of said rack-supporting members extending in said common direction, said major portions of said rack-

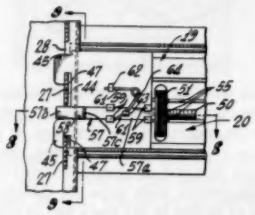
supporting members having a substantially uniform spacing therebetween which spacing is less that said spacing between said pairs of elongated rigid members defining said receptacle-supporting channels, said major portions of said rack-supporting members having an extent at least equal to a major portion of said fixed extent of said receptacle-supporting channels.

4,133,433

MERCHANDISING DISPLAY SYSTEM

Morris A. Wolf, 7048 Macapo Dr., Los Angeles, Calif. 90068

Filed Mar. 28, 1977, Ser. No. 781,555
Int. Cl.[2] A47B 57/16
U.S. Cl. 211—192 **12 Claims**



1. A merchandise display framework comprising:

a plurality of upright posts of hollow, generally rectangular cross-section, each having four substantially flat sides with elongated, narrow grooves extending longitudinally of the post in the central portions of said sides,

each of said grooves being bounded by two longitudinally extending ribs on the outer side of the post projecting a selected distance outwardly from the outer side, and by a channel having spaced sidewalls extending a selected distance into the post and a bottom wall extending between said sidewalls, said bottom wall having a series of slots therein of selected size and spacing; and

a plurality of elongated struts of hollow, generally rectangular cross-section extending generally horizontally between said posts in a selected arrangement, and having two relatively broad sides, two relatively narrow sides, and two ends positioned adjacent to two of said posts,

mounting brackets in said struts adjacent to said ends and each comprising a base plate supported in the strut for movement longitudinally of the strut toward and away from the adjacent end, and two hook-like tabs projecting from said base plate longitudinally of the strut outwardly through the end of the strut, said tabs having outer ends that are disposed in a common plane centered between said relatively broad sides and are sized and spaced to fit into two of the slots in said bottom wall, and having notches in corresponding sides for hooking around said bottom wall through the slots and loosely engaging said bottom wall, and

a tightening mechanism for each of said brackets comprising a threaded stud secured to the base plate and extending longitudinally of the strut inwardly away from the base plate, a nut threaded onto said stud, means mounting said nut in said strut for rotation and holding the nut against movement longitudinally of said strut, whereby rotation of the nut in one direction shifts said stud and said base plate inwardly and away from the adjacent end of the strut to tighten said tabs against said bottom wall, and a plunger mounted on said base plate for movement relative thereto longitudinally of said strut, said plunger having an outer end portion that is movable along the side of one of said tabs opposite the notch therein, and having an inner end portion for extending inwardly beyond said base plate, spring means acting between said base and said plunger to urge the latter inwardly toward a retracted position in which said outer end portion is retracted away from the tab, and means preventing inward movement of the plunger with said base during tightening of the tabs and thereby causing the plunger to be extended along one of the tabs into the associated slot during such tightening, said outer end portion of the plunger being sized to cooperate with the tab to substantially fill the slot and thereby lock the bracket to the post as an incident to tightening;

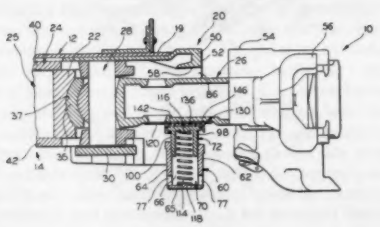
said struts having access slots in the sides thereof that are aligned with said nuts, and the latter being large enough to extend into said access slots for manual tightening of the brackets after the tabs thereof have been inserted in the slots in said bottom walls, whereby said posts and said struts are joined securely into a rigid display assembly with the struts in selected positions along the posts and with the exposed portions of said grooves available to receive display accessories.

4,133,434

SNAP-ON COUPLER BEARING PLATE FOR RAILROAD CAR COUPLER CARRIERS

Osvaldo F. Chierici, Elmhurst, Ill., assignor to Holland Company, Aurora, Ill.

Filed Oct. 26, 1977, Ser. No. 845,488
Int. Cl.[2] B61G 7/10
U.S. Cl. 213—61 **8 Claims**



1. In a railroad car wheeled for riding on track rails and having a body including a center sill projecting from one end of the car and equipped with a coupler striker casting and a coupler mounted on the center sill for swinging movement sidewise of the car, said coupler including a shank extending through the casting and having a wear plate anchored to its underside, with the casting including a striking face disposed in a vertical plane and disposed transversely of the car center line of draft, said casting adjacent said face having a cage portion defining below the coupler shank an upwardly opening socket defining a coupler carrier chamber, and a coupler carrier resiliently mounted in said chamber on which the coupler shank wear plate rests, with the coupler carrier having an upwardly facing planar load support plate defining a flat horizontally disposed load support surface on which the coupler shank wear plate rides for supporting the coupler on the coupler carrier, with said coupler carrier load support plate defining opposed inner and outer edge portions respectively projecting in the plane of said load support plate in overhanging relation to said coupler carrier, a coupler bearing plate for said load support plate, said bearing plate comprising:

a bearing member of inverted channel shape configuration defining a planar web portion, an inner depending flange portion along the inner side of the same and an outer depending flange portion along the outer side of same,

said member inner flange portion including a forwardly projecting ledge portion underlying said member web portion and spaced below said member web portion to receive the inner edge portion of the coupler carrier load support plate therebetween,

said member outer flange portion projecting downwardly to the level of said member ledge portion and being formed to define a downwardly facing wedge surface therealong that inclines upwardly in the direction of said member

inner flange portion for camming said member outer flange portion over the outer edge portion of the coupler carrier load support plate when said member is applied to said load support plate with said load support plate inner edge portion lodged between said web portion and ledge portions thereof with said web portion thereof overlying said load support plate surface and said member is hammered downwardly along the outer side of same to mount said bearing member in its operative position on said load support plate,

said member being of one piece construction formed from a ultra high molecular weight polyethylene of dry self lubricating characteristics,

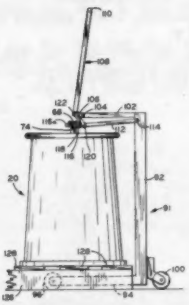
said member web portion defining an upwardly facing slide surface on which the coupler shank wear plate engages when said bearing plate is in its said operative position.

4,133,435

WIRE CARRYING SPOOL AND APPARATUS FOR SUPPORT AND LIFTING THEREOF

Hugh W. Hosbein, Fort Wayne, Ind., assignor to Mossberg Hubbard a Division of Wanskuck Company, Garrett, Ind.

Filed Aug. 8, 1977, Ser. No. 822,874
Int. Cl.[2] B66F *3/00*
U.S. Cl. 214—1 D **6 Claims**



1. A manually operable lifting mechanism comprising a supporting frame having a horizontal base portion provided with an upright portion and a horizontal supporting arm portion rigidly secured at one end to the upper end of said upright portion to overhang said base portion, a lifting lever disposed above said supporting arm portion and being pivotally connected at one end to the outer end portion of said supporting arm portion for swinging movement between first and second positions, said second position disposing said lever above and in substantial parallelism with said supporting arm portion and said first position disposing said lever above said supporting arm portion at an angle thereto, a load-lifting arm pivotally connected at one end to said upright portion beneath said supporting arm portion in substantial parallelism with the latter to extend substantially horizontally, and means connecting said lifting lever to said pivoted arm at a location spaced from the distal end of said pivoted arm for swinging said pivoted arm upwardly and downwardly when said lifting lever is swung between its first and second positions, respectively.

4,133,436

METHOD OF RETRIEVING ARTICLES FROM STORAGE AND AN APPARATUS FOR CARRYING OUT THE METHOD

Jan Dahm, Vagslia 24, Tertnes, Norway

Filed Apr. 12, 1977, Ser. No. 786,829
Claims priority, application Norway, Apr. 13, 1976, 761276
Int. Cl.[2] B65G *1/04*
U.S. Cl. 214—16.4 A **4 Claims**

1. Article storage and handling system for retrieving an article from a storage rack and transferring said article to a collecting conveyor which comprises:

(a) a storage rack having a series of drivable roller tracks arranged above each other as well as side-by-side;

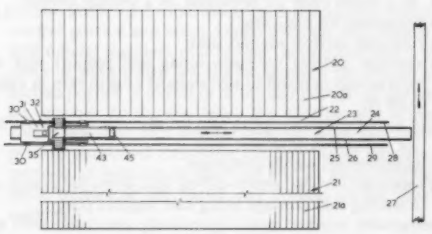
(b) an article transfer assembly common to said series of roller tracks and comprising:

(i) article retrieving means adapted to be drivably adjusted in a vertical direction into operative retrieving cooperation with a preselected one of said roller tracks, said retrieving means comprising guide means and a horizontal conveyor drivable transversely of the length of said guide means, said guide means providing a rectilinear path for said article between said roller track and said horizontal conveyor,

(ii) an inclined conveyor one end of which cooperates with said horizontal conveyor and is adapted to be raised and lowered along with said article retrieving means,

(iii) a carriage unit supporting said article retrieving means and inclined conveyor and including an upstanding column, and

(iv) an adjusting means for adjusting the height of said article retrieving means into an accurately aligned position with respect to said preselected roller track and comprising rough and fine adjustment mechanisms,



(c) a horizontal collecting conveyor supporting the other, opposite end of said inclined conveyor and said carriage unit being mounted for horizontal displacement along said collecting conveyor; and

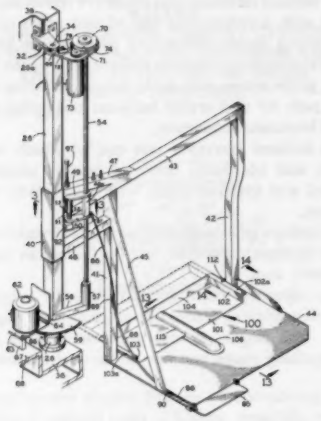
(d) a stopping machanism for said preselected roller track enabling transfer of said article from said rack to said retrieving means; the horizontal conveyor, the inclined conveyor and the collecting conveyor being adapted to advance said article in continuous motion in one and the same direction and said column guidably permitting said article retrieving means to be moved by way of said rough adjustment mechanism somewhat beyond a desired position while the fine adjustment mechanism automatically and accurately adjusts said retrieving means into a preselected height position on said column, said rough adjustment mechanism comprising a pivotably mounted pressure medium cylinder operatively associated with an axially displaceable pawl moveable inwardly and self-centeringly into an intermediate space defined between guide pins arranged in a vertical row on a vertical guide rail of said column and said fine adjustment mechanism comprising at least one of a pair of compression springs and a pair of pressure medium-controlled control means arranged one on each side of said pawl and providing for the adjustment of said pawl into an accurately centered position.

4,133,437

WHEEL CHAIR LIFT APPARATUS

F. Alan Gates, Fort Lauderdale, Fla., assignor to Helper Industries, Inc., Fort Lauderdale, Fla.

Filed Sep. 9, 1977, Ser. No. 831,902
Int. Cl.[2] B60P 1/44
U.S. Cl. 214—75 R 23 Claims



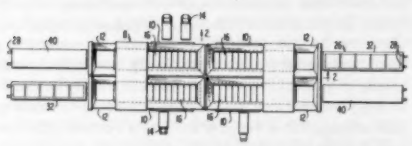
1. In a wheel chair lift apparatus on a vehicle having:
a horizontal lift platform;
a rotatable vertical support post;
a carriage slidable vertically along said support post and operatively coupled to said support post to turn in unison with it;
and means rigidly coupling said lift platform to said carriage for movement in unison with it;
the improvement which comprises
a rotatable, vertical, power-driven lead screw for raising and lowering said carriage along said support post;
retractable retainer means operatively associated with said lift platform for movement between a retracted position in which it permits the wheel chair to move on or off the lift platform and a raised position in which it retains the wheel chair on the lift platform;
and means responsive to the operation of the lead screw for maintaining said retainer means in its raised position whenever the lead screw is carrying the weight of the carriage and lift platform.

4,133,438

APPARATUS FOR TRANSFERRING REFUSE

Harvey W. Liberman, Knoxville, and John C. Salyers, Oak Ridge, both of Tenn., assignors to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 641,757, Dec. 17, 1975, Pat. No. 4,044,905.
This application May 19, 1977, Ser. No. 798,712
Int. Cl.[2] B30B 15/30
U.S. Cl. 214—310 5 Claims



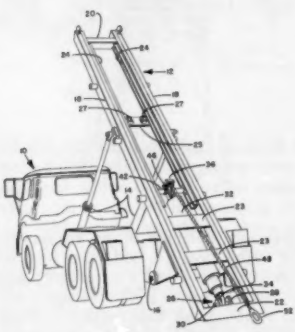
1. Refuse handling apparatus comprising:
a refuse container having a movable closure at one end thereof and a movable wall member;
a refuse packer assembly having a discharge opening;
a loading carriage for removably receiving said container and supporting said container in alignment with said discharge opening;
said loading carriage being movable toward and away from said discharge opening;
means for moving said carriage toward said discharge opening for receiving refuse from said packer assembly;
means for raising said closure to provide an opening for the insertion of refuse into the container;
ejector means disposed at a location remote from said packer assembly and said loading carriage;
a movable unloading carriage carrying said ejector means;
means to move said unloading carriage;
said container being removable from said loading carriage and transportable to said unloading carriage;
said unloading carriage removably receiving said container in a position in which said movable wall is aligned with said ejector means; and
means for actuating said ejector means to displace said movable wall to discharge refuse.

4,133,439

VEHICLE BODY LOADING AND UNLOADING MECHANISM

Paul L. Goranson, Knoxville, Tenn., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Feb. 14, 1977, Ser. No. 768,127
Int. Cl.[2] B60P 1/28
U.S. Cl. 214—505 3 Claims



1. Apparatus for loading and unloading containers onto and off of a vehicle body comprising
a tilting frame mounted on the vehicle body for vertical pivotal movement about the rear of the vehicle body, and including at least two spaced, substantially parallel, frame members,
a guide member mounted on the inside of each of the frame members,
a support member extending between the guide members and movably supported by the guide members for movement along a portion of the length of the tilting frame,
a sheave concentrically mounted on and rotatable about the support member,
a hydraulic cylinder positioned between the frame members, extending substantially parallel thereto, having a first end secured to the support member so that movement of the hydraulic cylinder causes the support member and the sheave to move forward and backward along the tilting frame, and having a bracket located at a second end thereof wherein the bracket defines a hole,
a rear cross member extending widthwise across the rear of the tilting frame,
a hydraulic cylinder mounting means located substantially at

the rear of the tilting frame for supporting the second end of the hydraulic cylinder, and including

a yoke secured to and extending outward from the rear cross member, and having a pair of arms wherein the arms define a pair of aligned holes, and

a disengageable pin extending through the hole defined by the bracket and the holes defined by the arms of the yoke for disengageably securing the second end of the hydraulic cylinder to the tilting frame,

a cable having a first end secured to the tilting frame beneath the hydraulic cylinder, and having a second end extending around the sheave and toward the rear of the tilting frame so that movement of the sheave causes movement of the second end of the cable, and

means on the second end of the cable to attach the cable to a container to be loaded onto the vehicle, and wherein

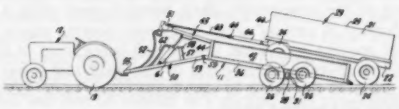
the guide members extend to a point short of the rear of the tilting frame and are open at their rear end so that the support member can be removed from the rear of the guide members after the second end of the hydraulic cylinder is disengaged from the tilting frame to remove the hydraulic cylinder from the tilting frame.

4,133,440

TRAILER CARRIER

Joseph A. Heidrick, Jr., Rte. 4, Box 686, Woodland, Calif. 96595

Continuation of Ser. No. 754,587, Dec. 27, 1976, abandoned.
This application May 16, 1978, Ser. No. 906,651
Int. Cl.[2] B60P *1/04*
U.S. Cl. 214—506 **3 Claims**



1. A trailer carrier for transporting a roadworthy trailer through a row crop field, said trailer having road wheels of a normal roadway tread width, said trailer carrier comprising:

an elongated bed of a width to support and transport said trailer and having ground engaging wheels laterally spaced apart a distance greater than said normal roadway tread width;

hitch means pivotally connected to said bed on a transverse axis for connecting said trailer carrier to a tractor having laterally spaced ground wheels of a tread width less than that of said carrier, said hitch means being skewed relative to said bed and when engaged with said tractor the wheels on one side of said carrier are longitudinally aligned with the wheels on the corresponding side of said tractor; and

actuator means connected to said bed and to said hitch means for selectively tilting the bed between a first position in which the after end of the bed engages the ground to afford an on-ramp and an off-ramp for the trailer and a second position wherein the bed is substantially horizontal to transport a trailer thereon.

4,133,441

INJECTION SITE

Herbert Mittleman, Deerfield, and Michael O. Pekkarinen, Lincolnshire, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

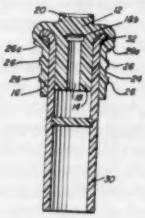
Filed Mar. 23, 1978, Ser. No. 889,207
Int. Cl.[2] B65D *47/36*
U.S. Cl. 215—247 **2 Claims**

2. In a tubular member having an outwardly flared end portion, a unitary, molded injection site pressure fitted into the end of the tubular member, comprising:

a central portion for receiving a needle therethrough, said central portion being located above the bottom of the outwardly flared end portion;

a first, generally cylindrical portion contiguous with said central portion and extending into said tubular member, said first portion defining a central bore which terminates at one end at said central portion and is open at the other end;

said central bore defined by said first portion comprising an elongated axial bore with a portion of the bore adjacent said central portion forming an undercut to enable said central portion, when pierced by a needle, to have greater stretching potential than if the undercut were not present, said undercut comprising an open volume adjacent said



central portion, which open volume has a greater diameter than the diameter of the central bore other than said open volume;

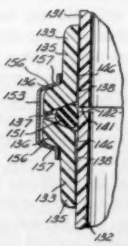
a second, generally cylindrical portion contiguous with said central portion and being folded over the end portion of said tubular member, said second portion carrying a plurality of rings which are in a compressed state when said second portion is folded over the end portion of the tubular member, to thereby retain the injection site in place with respect to said tubular member with said central portion positioned transverse the opening of the tubular member, at least one of the rings is at an angle exerting a force transverse the flared end portion of the tubular member.

4,133,442

TANK CLOSURE ASSEMBLY

Arthur J. Wiltshire, Richmond Heights; Harry R. Nara, Novelty; Edward T. LeBreton, Mentor, and Ward L. Bliley, Chesterland, all of Ohio, assignors to Structural Fibers, Inc., Chardon, Ohio

Filed Dec. 27, 1976, Ser. No. 754,830
Int. Cl.[2] B65D *7/02, 45/32*
U.S. Cl. 220—5 R **13 Claims**



1. A molded fiber-reinforced, plastic split tank assembly comprising a pair of tank sections having mating faces of substantially equal diameter in a transverse plane, said tank sections each having a generally uniform wall thickness and cylindrical sidewall portions of generally uniform outside diameter as produced by bag molding processes, each of said sections

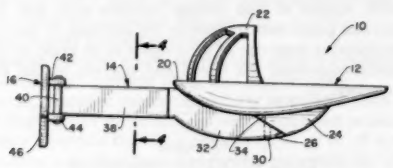
being provided with a nonintegral separately formed, external, circumferential flange adjacent its respective face, each of said flanges having a radially inwardly facing surface describing an inside diameter greater than the inside diameter of its respective tank section, means axially locking each of said flanges to its associated tank section, a circumferential split band encircling said flanges, said band having inwardly facing portions in abutting contact with rearward surfaces of said flanges, means for releaseably circumferentially tightening said band, said inwardly facing portions and said rearward flange surfaces being arranged to provide a wedging action therebetween to cause said sections to be drawn axially toward each other upon circumferential tightening of said band, a single O-ring disposed between said flanges and adapted to be compressed between opposed, forward faces of said flanges when said band is tightened, said O-ring being constructed and arranged with respect to said forward flange faces to seal the circumferential zone surrounding said opposed tank faces when compressed between said flanges, said radially inwardly facing surface of each flange forming an internal bore extending along a major portion of the axial length of the flange, said bore being tapered along a major portion of its length with increasing diameter in a direction towards its forward flange face, said axial locking means of each flange including a bonding medium disposed between the bore and sidewall along a major portion of the length of the bore.

4,133,443

SOAP DISH

Joseph Medina, and Helene H. Medina, both of 914 Le Borgne, La Puente, Calif. 91746

Filed Jul. 1, 1977, Ser. No. 812,152
Int. Cl.[2] B65D *25/24;* A47K *1/08, 5/08*
U.S. Cl. 220—18 **8 Claims**



1. A soap dish comprising:

an arm having an inner end and an outer end. said arm having a longitudinal center axis adapted to be located horizontal, said inner end including first connecting means, said outer end including second connecting means;

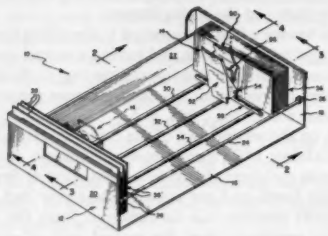
a tray adapted to receive a cake of soap, said tray having a front end and a back end, said tray having third connecting means, said second connecting means including a first planer surface inclined with respect to said longitudinal center axis, said third connecting means including a second planer surface inclined with respect to said longitudinal center axis, said first and second planer surfaces to always be in continuous contact with each other, said second and third connecting means cooperating to support said tray upon said arm, said tray being movable upon said arm from a first position to a second position, said first position being with said tray located substantially horizontal, and in longitudinal alignment with said longitudinal center axis and with said front end extending forwardly of said arm and said back end located directly above said arm, said second position being with said tray located at an inclined position, with said front end now located above said arm and said back end now directed forwardly of and below said arms, said third connecting means being fixedly positioned upon said tray.

4,133,444

FILING SYSTEM

Thomas H. Snethen, Dewitville, N.Y., assignor to United Business Equipment Corp., Buffalo, N.Y.

Filed Feb. 9, 1978, Ser. No. 876,354
Int. Cl.[2] B65D *25/06*
U.S. Cl. 220—22.4 **4 Claims**



1. In a filing system including a storage tray having a bottom wall, front and rear walls upstanding from front and rear ends of said bottom wall and at least three parallel support rods and supported by said front and rear walls and arranged in a spaced parallel relationship relative to said bottom wall; and a compressor for releasably engaging materials filed within said tray in engagement with said rods, the improvement wherein said compressor comprises in combination:

a first compressor part having an upper operator end portion and a lower end portion;

a second compressor part having an upper operator end portion and a lower end portion, said lower end portion of one of the compressor parts being formed with a slot bounded in part by upper and lower bearing edges, said slot opening at one end thereof and being sized to freely and removeably receive one of said rods, said lower end portion of the other of said compressor parts having a lower end bearing edge;

hinge means for joining said compressor parts for pivotal movement about a pivot axis for removeably mounting said compressor parts on said one rod with said upper and lower bearing edges disposed in frictional surface engagement with upper and lower surfaces of said one rod and with said lower end bearing edge disposed in frictional surface engagement with said upper surface of said one rod, said first and second compressor parts when mounted on said one rod being free to tilt about the axis thereof and have their lower end portions arranged to extend upwardly and towards said rear and front walls of said tray, respectively;

resiliently deformable means for normally maintaining said compressor parts mounted on said one rod; and

anti-tilt means in a form of a bar fixed to one of said compressor parts to overlie and engage with other ones of said rods for limiting tilting movement of said compressor parts about the axis of said one rod when mounted thereon.

4,133,445

PILL DISPENSING AND STORAGE DEVICE

Isidore Mandelbaum, 803 Springmill La., Indianapolis, Ind. 46260

Filed Apr. 5, 1977, Ser. No. 784,734
Int. Cl.[2] B65D *21/02*
U.S. Cl. 220—23.4 **9 Claims**

1. A unit of reusable containers for storing medicine and the like comprising:

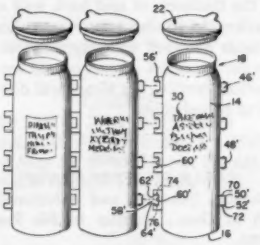
a plurality of separate containers each container having an elongate body portion having a longitudinal dimension and which is closed at one end and open at the other end thereof;

a closure cap for each container which engages the open end

of each container body portion to close said each container body portion;

a projecting locking element mounted on each container body portion, said first locking element having an outer perimeter;

a gripping jaw element mounted on each container body portion, said gripping jaw element having a pair of spaced projecting members and a base having an edge spaced from said container body and connecting said projecting members together to define a blind-ended opening, said gripping jaw element being mounted on said container body portion so that said blind-ended opening is coplanar



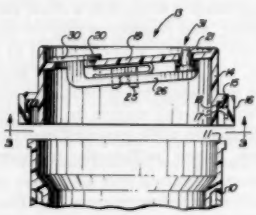
with a plane intersecting said container body portion so that said projecting members are spaced apart along the longitudinal dimension of said container body portion, said gripping jaw elements having means for gripping said locking element so that a gripping jaw element of one container releasably locks with a projecting locking element of an adjacent container to couple those adjacent containers together so that a unit formed of the coupled containers can assume a curved configuration, whereby said unit can be carried in a pocket, said projecting and gripping jaw elements being reconnectable with each other after separation.

4,133,446

DRINKING VESSEL COVER WITH VALVE CONTROLLED OPENINGS

Kenneth J. Albert, Beverly Hills, Calif., assignor to Thermo-Seal, Inc., Los Angeles, Calif.

Filed Feb. 27, 1978, Ser. No. 881,384
Int. Cl.[2] A47G *19/22*
U.S. Cl. 220—90.4 **11 Claims**



1. In a cover of heat-insulating material intended for detachable connection to a drinking vessel having a body of heat-insulating material and including a cylindrical wall having an upper edge defining an open top:

(a) a cylindrical wall having a lower end portion;

(b) means for detachably securing the lower end portion of said cylindrical wall to the cylindrical wall of said body;

(c) an inclined flat wall integral with said cylindrical wall adjacent to the upper edge thereof and presenting a zone of maximum depth and an area of minimum depth, speaking with reference to the upper edge of said cylindrical wall;

(d) a drinking opening formed in said inclined wall in said zone of maximum depth;

(e) a relief vent formed in said inclined wall at said area of minimum depth and diametrically opposed to said drinking opening;

(f) a lever spaced from and pivotally mounted on the underface of said inclined wall substantially midway between said drinking opening and said relief vent;

(g) a stub arm integral with and upstanding from one end of said lever, and extending through said drinking opening;

(h) a valve member integral with said arm and of an extent greater than said drinking opening whereby said valve member engages the upper surface of said inclined flat wall when in position closing said drinking opening;

(i) another valve member integral with and upstanding from the other end of said lever and including a pushbutton passing through said relief vent and extending above the upper surface of said inclined wall, said last-mentioned valve member having a portion engaging the underside of said inclined wall to close said relief vent; and

(j) a spring interposed between said inclined wall and said lever and normally biasing said lever to move said valve members into position closing said drinking opening and said relief vent;

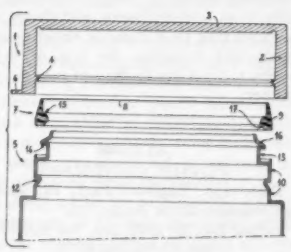
(k) whereby downward movement of said last-mentioned valve member opens said relief vent and further causes upward movement of the first-mentioned valve member to open said drinking opening.

4,133,447

INVIOLABLE CLOSING DEVICE FOR CONTAINERS

Bernard Bouchet, Oyonnax, France, assignor to Etablissements Leon Goiffon, Oyonnax, France

Filed Nov. 8, 1977, Ser. No. 850,092
Claims priority, application France, Nov. 9, 1976, 76 34385
Int. Cl.[2] B65D *51/22*
U.S. Cl. 220—258 **7 Claims**



7. A closed and sealed container, comprising:

a container body terminating in a container neck having a free, open end, said container neck having an annular groove adjacent the free open end thereof with a lip located between the free open end and said groove whereby said lip defines said groove; and means on said neck spaced from said groove to engage a cap;

a deformable collar formed of synthetic material and fitting tightly within said groove of said container neck, said collar having an upper wall formed of synthetic plastic film lying over and closing the free open end of said container neck, whereby said collar cannot be removed from said neck without destruction of said collar;

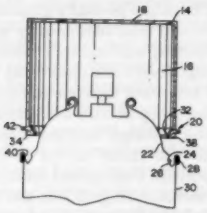
a hollow cap having a cylindrical skirt and closed at its upper end by a top wall, said cap engaging the neck of said container at said cap engaging means, and overlying said collar.

4,133,448

OVERCAP FOR AEROSOL CONTAINER

Robert W. Balfanz, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed May 27, 1977, Ser. No. 801,133
Int. Cl.[2] B65D *43/10*
U.S. Cl. 220—306 **4 Claims**



1. A container and overcap combination comprising:

a container of the type having a snap lock dome and a cylindrical container body joined together by a circular doubleseam, said dome having a radially protruding snap bead forming an undercut radially spaced a first distance from said doubleseam, said undercut being axially spaced a second distance below the top of the doubleseam; and

an overcap engaged with said container, said engaged overcap comprising:

an enclosure having a circular lower edge;

a radially inwardly extending annular ring near said lower edge, said ring having an inner edge with an inner diameter less than the outer diameter of said snap bead, said inner edge being received in said undercut;

a plurality of circumferentially spaced radial ribs, said ribs being substantially parallel to the axis of said cylindrical container body and extending radially outwardly from the annular ring to outer ends engaging said doubleseam, such that the distance in a radial direction between the inner edge of the annular ring and the outer ends of said ribs is substantially equal to said first distance, at least some of said ribs being deformed at their outer ends by engagement with said doubleseam; and

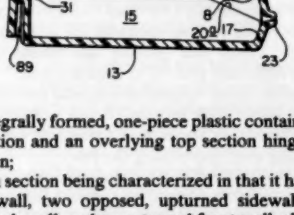
a doubleseam-engaging flange extending radially outwardly from said enclosure, said flange axially spaced above said ring by a distance about equal said second distance and engaging the top of the doubleseam whereby to limit the loading of said overcap onto said container.

4,133,449

PLASTIC CONTAINER

Efrem M. Ostrowsky, Highland Park, Ill., assignor to Ethyl Products Company, Baton Rouge, La.

Filed Jul. 28, 1975, Ser. No. 599,769
Int. Cl.[2] B65D *43/16*
U.S. Cl. 220—339 **11 Claims**



1. In an integrally formed, one-piece plastic container having a bottom section and an overlying top section hinged to said bottom section;

said bottom section being characterized in that it has a planar bottom wall, two opposed, upturned sidewalls, an upturned back wall, and an upturned front wall, all of which are integrally formed and connected to each other, said upturned front wall carrying top latching lug means; and said top section being characterized in that it has a planar top wall, two opposed downturned sidewalls, a downturned front wall, all of which are integrally formed and connected to each other and a downturned back wall integrally formed and connected to said top wall, said downturned front wall carrying bottom latching lug means for engaging said lug means on said upturned front wall of said bottom section to latch said top section to said bottom section;

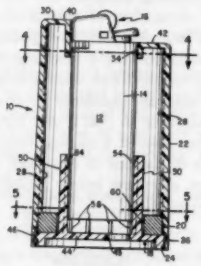
the improvement which comprises: said downturned back wall and said planar top wall being connected one to the other to form an obtuse angle therebetween and said planar top wall and said downturned back wall are connected by flexing joint means having a web of plastic material with a thickness of less than one-half the thickness of said back wall and said planar top wall whereby said flexing joint means allows said planar top wall to move forward upon application of downward pressure to the two rearmost corners of said top section so that said top and bottom latching lug means will disengage to allow said container to be unlatched.

4,133,450

TABLE LIGHTER DEVICE

Thomas T. Beeson, Fairfield, and Salvatore A. LaMonica, Derby, both of Conn., assignor to Bic Pen Corporation, Milford, Conn.

Filed Jun. 14, 1977, Ser. No. 806,342
Int. Cl.[2] B65D *25/02, 85/20*
U.S. Cl. 220—411 **17 Claims**



1. A table lighter device which comprises in combination:

(A) a base member having a plurality of integral upstanding projections disposed to receive a generally elongated pocket lighter therebetween;

(B) a weighted ring member positioned on the base member about the periphery of the upstanding projections; and

(C) an upstanding housing secured by a lower end portion to the base member, said housing having an opening at an upper end portion which is configurated to receive the pocket lighter, said opening being aligned generally vertically with the upstanding projections, said housing being dimensioned to removably receive the body portion of the pocket lighter therein while exposing operative elements of the pocket lighter sufficiently to permit lighting thereof.

4,133,451

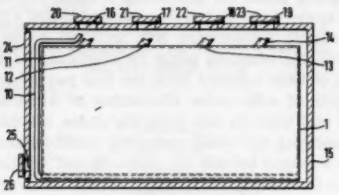
CONTAINER LINER

Henry Ratter, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed May 31, 1977, Ser. No. 802,032
Claims priority, application United Kingdom, Jun. 1, 1976, 22563/76
Int. Cl.[2] B65D *25/14;* B65J *1/02*
U.S. Cl. 220—461 **10 Claims**

1. A liner constructed of a pliable material and which comprises at least one aperture through which the liner may be charged with finely-divided solid particulate material, at least

in the region of the base of the liner an inner skin and an outer skin the inner skin being perforated to allow passage of gas,



and at least one entry port through which gas may be introduced between the inner skin and the outer skin.

4,133,452

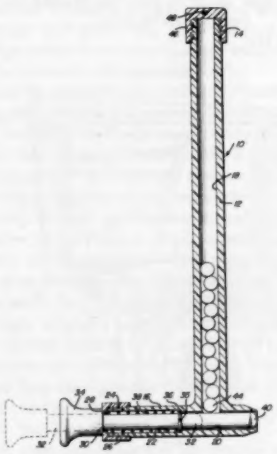
SALMON EGG DISPENSER

James W. Wiltrout, R.D. #1, Markleton, Pa. 15551

Filed May 23, 1977, Ser. No. 799,646

Int. Cl.[2] A01K *97/04*; B65G *59/00*

U.S. Cl. 221—185 **4 Claims**



1. A bait dispenser including an upstanding tubular body defining a longitudinal passage extending therethrough, a closure removably supported from said body and closing the upper end of said passage, a generally horizontal tubular head carried by the lower end of said body and defining a longitudinal bore extending therethrough, the lower end of said passage opening centrally into said bore intermediate its opposite ends, said passage being of a diameter adapted to receive a plurality of stacked salmon eggs therein, an elongated plunger snugly reciprocal in said bore, one end of said bore including a counterbore spaced from said passage, said plunger including laterally outwardly projecting first abutment means seated in said counterbore and said plunger including a first rounded end disposed on the side of said passage remote from said counterbore and retractable past said passage toward said counterbore, adjacent the outer end of said counterbore an inwardly projecting second abutment means, and a coiled compression spring disposed about said plunger in said counterbore with one end thereof seated against said outwardly projecting first abutment means and the other end thereof seated against said inwardly projecting second abutment means and thereby yieldingly biasing said plunger to a static position extending across and thus blocking the lower end of said passage, the second end of said plunger includng an enlarged head thereon outwardly of said counter bore, said plunger being shiftable in said bore and counterbore sufficiently away from said static position and against the biasing action of said spring to retract said first end of said plunger across the lower end of said passage, said plunger including a circumferential groove, said first abutment means comprising a split abutment ring seated in said groove and snugly slidably received in said counterbore, said second abutment means comprising a centrally apertured end wall on a closure cap secured over head closing the outer end of said counterbore, said plunger being snugly slidingly received through the central aperture in said end wall.

4,133,453

TONER RESIDUAL AMOUNT DETECTING DEVICE

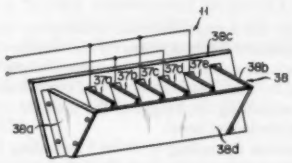
Shinichiro Ohbora, Kawasaki, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Dec. 16, 1976, Ser. No. 751,477

Claims priority, application Japan, Dec. 18, 1975, 50-150189; Jun. 16, 1976, 51-69711; Jul. 19, 1976, 51-85012

Int. Cl.[2] B67D *5/32*; G08B *7/06*

U.S. Cl. 222—39 **4 Claims**



1. A toner residual amount detecting device detecting a residual amount of toner in a longitudinal toner hopper having a toner outlet at the bottom thereof and a triangular cross section, comprising:

a capacitor structure constituted by a plurality of electroconductive plates each having a triangular shape corresponding to the cross section of the toner hopper and facing spaced equidistantly at a predetermined internal of at least 15 mm to form a capacity therebetween and vertically disposed in the toner hopper with the surface of the plates perpendicular to a longitudinal axix of the toner hopper, the capacity being varied in correspondence with the change of the residual amount of toner received in the toner hopper having the capacitor structure and the odd numbered electroconductive plates being connected in common with each other to constitute one electrode of the capacitor structure while the even numbered electroconductive plates are connected in common with each other to constitute the other electrode;

a capacity detecting circuit for detecting the capacity of the capacitor structure to produce an electric signal corresponding to the capacity of the capacitor structure; and

means for responding to the electric signal from the capacity detecting circuit to indicate the residual amount of the toner.

4,133,454

APPARATUS FOR DETERMINING THE LENGTH OF A COLUMN OF TOBACCO OR SIMILAR MATERIAL

Hugh M. Arthur, and Timothy C. Harrington, both of London, England, assignors to Molins Limited, England

Filed Oct. 4, 1976, Ser. No. 729,467

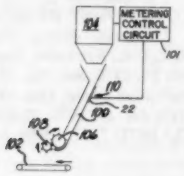
Claims priority, application United Kingdom, Oct. 8, 1975, 41154/75

Int. Cl.[2] B67D *5/08*; G05D *9/00*

U.S. Cl. 222—56 **23 Claims**

1. Apparatus for determining the height of a column of tobacco or similar particulate material showered into a downwardly extending channel having walls and being opened at both ends, comprising a first capacitor having a fixed value; a

second capacitor having spaced electrode plates which extend along the channel above and below a desired average preselected level of the top surface of the tobacco column in the channel, whereby the space between the plates contains tobacco in a lower region and air in an upper region when the top surface of the tobacco column is at said preselected height; a third capacitor having spaced electrode plates which extend along the channel, below the second capacitor, whereby the space between the plates of the third capacitor is permanently filled with tobacco which has passed between the plates of the second capacitor; and control means connected to said first,



second and third capacitors for comparing the value of the second capacitor with the sum of the values of the first and third capacitors and producing a column height signal which is unaffected by the moisture content of the tobacco and is effective for controlling the height of the tobacco column to maintain said preselected level.

9. Apparatus according to claim 1 including means for feeding tobacco continuously from the lower end of the channel, and means for feeding tobacco into the upper end of the channel at a speed which varies in response to the column height signal of said control means so as to maintain substantially the height of the column of tobacco in the channel.

4,133,455

WEIGHING APPARATUS FOR CONTINUOUSLY WEIGHING A PASSING LAYER OF FIBER MATERIAL IN A METERING DEVICE OF A SPINNING PREPARATORY MACHINE

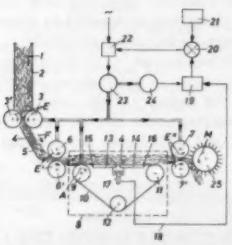
Robert Moser, Winterthur, Switzerland, assignor to Rieter Machine Works Limited, Winterthur, Switzerland

Filed Feb. 3, 1975, Ser. No. 546,429

Claims priority, application Switzerland, Mar. 8, 1974, 3266/74

Int. Cl.² G01G *11/04, 11/12*

U.S. Cl. 222—77 **12 Claims**



1. A weighing apparatus for continuously weighing a throughpassing continuous layer of fiber material in a metering device of a spinning preparatory machine, comprising two pair of rolls constituting a first pair of rolls and a second pair of rolls arranged in spaced relationship from one another and defining therebetween a measuring zone, said two pairs of rolls serving for supplying the layer of fiber material to and for removing the layer of fiber material from said measuring zone disposed between said spaced pairs of rolls, said rolls transporting the layer of fiber material across said measuring zone at a predetermined speed of movement, two weighing plates located in said measuring zone, means for mounting each of said weighing plates for pivotal movement about a respective pivot axis, a measuring signal transmitter operatively connected with said two weighing plates for generating a signal which depends upon the angle of pivoting of the weighing plates, a thin highly flexible endless transporting belt arranged to contactingly glide across the weighing plates for additionally transporting the layer of fiber material from the first pair of rolls to the second pair of rolls under elimination of irregular friction forces of said layer on said weighing plates, the sides of said thin transporting belt being connected with two endless driving belts arranged beyond the reach of said weighing plates and means for driving said driving belts and for controlling the speed of said transporting belt at substantially the predetermined speed of movement at which said rolls transport the layer of fiber material across the measuring zone.

4,133,456

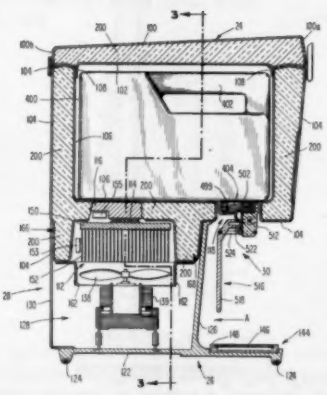
TEMPERATURE-CONTROLLED LIQUID DISPENSER

Louis J. Corini, 6411 Hawthorne St., Philadelphia, Pa. 19149

Filed Apr. 26, 1977, Ser. No. 791,061

Int. Cl.² B67D *5/62*

U.S. Cl. 222—146 HE **9 Claims**



1. A temperature controlled liquid dispenser for dispensing a liquid into a demand container, comprising:

(a) a heat insulated receptacle having an opening;

(b) a temperature control means in contact with a portion of said receptacle for controlling the temperature of the contents of said receptacle;

(c) a base means engaging the underside of said insulated receptacle for supporting said insulated receptacle above said demand container;

(d) a portable liquid-storage disposed in said insulated receptacle, said liquid-storage container having a nozzle portion which is disposed within said opening;

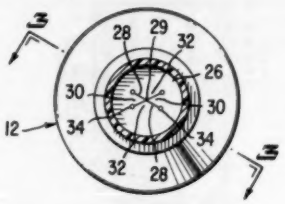
(e) a valve means for controlling the flow of liquid from said liquid-storage container, said valve means pivotal between a closed position and an open position, said valve means removably attached to said nozzle portion; and

(f) a delivery means to provide a path along which said liquid can flow from said liquid-storage container toward said demand container, said delivery means comprising: a gasket nipple for insertion between said nozzle portion and said valve means, said nipple having a tubular portion, said valve means closing said tubular portion when said valve means is in the closed position, thereby preventing the flow of liquid from said liquid-storage container.

4,133,457
SQUEEZE BOTTLE WITH VALVE SEPTUM

Edward J. Klassen, 17331 Tramonto Dr., No. 6, Pacific Palisades, Calif. 90272

Continuation-in-part of Ser. No. 664,515, Mar. 8, 1976, abandoned. This application Feb. 10, 1977, Ser. No. 767,525
Int. Cl.[2] B65D *35/52*
U.S. Cl. 222—212 14 Claims



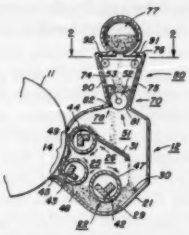
1. A spill-proof squeeze bottle liquid dispenser comprising:
a liquid container having an outlet opening to the exterior of said container and a resiliently flexible wall adapted to be deflected inwardly to expel liquid from the container through said outlet and then released for elastic strain energy return to its normal shape with resultant air inflow to the container through said outlet;
a septum of relatively thin resiliently flexible material spanning said outlet and containing a substantially 90° butt cut slit formation defining a resiliently flexible tongue-like valve flap integrally joined along a hinge line area to the septum proper for outward and inward deflection of said flap from the plane of said septum to provide a liquid flow opening through said septum complemented by said flap;
said valve flap having a closed normal unstressed position within said septum liquid flow opening substantially coplanar with the septum wherein the flap complements and seals said liquid flow opening against liquid passage therethrough, whereby said flap is deflected outwardly from said normal position by internal liquid pressure when said container wall is deflected inwardly to permit expulsion of liquid from the container through said outlet, and said flap is returned to its normal position by elastic strain energy to block passage of liquid from the container through said outlet upon equalization of the internal container pressure and ambient air pressure;
and an air flow opening in said septum of a cross-sectional area that is porous with respect to the passage of air and non-porous with respect to the passage of the contained liquid.

4,133,458
TONER DISPENSER ARRANGEMENT

Thomas J. Budny, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 2, 1977, Ser. No. 793,119
Int. Cl.[2] G01F *11/20*
U.S. Cl. 222—228 4 Claims

1. Apparatus for dispensing a controlled amount of particulate material comprising
a housing for containing said material including wall means defining an elongated dispensing opening, a roll disposed in said opening, means for rotating said roll, said roll operative when stationary to block the passage of material through said opening, and operative when rotating, to dispense said material through said opening, and a foraminous endless web at least partly wound around the periphery of said roll and rotatable in unison therewith, wherein said web is carried jointly by said roll and another roll

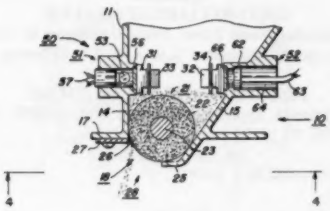


supported in said hopper and said web is rotated by friction contact with said roll.

4,133,459
DEFORMABLE TONER DISPENSER WITH FLOW RATE CONTROLLER

John E. Forward, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 2, 1977, Ser. No. 802,757
Int. Cl.[2] G01F *11/00, 13/00*
U.S. Cl. 222—314 7 Claims



1. In a toner dispenser including a rotatable resilient dispensing member, and an edge in frictional contact with said member to dispense toner, and wherein the rate of toner dispensation from said roll varies as a function of the deformation of said roll by said edge, the improvement comprising;
means for mounting said edge for movement toward and away from said roll wherein the distance between the edge and the axis of said roll varies along said axis and wherein the edge is spaced closer to said axis adjacent both ends of said roll relative to central portion of said roll.

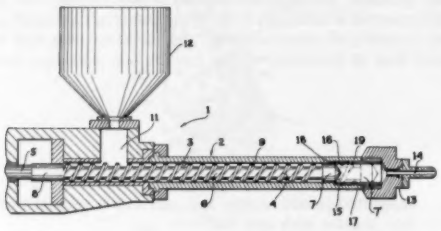
4,133,460
APPARATUS EMBODYING EXPLOSIVELY REMOVABLE SLEEVE

Jeffery P. Jerpbak, 506 Falls Rd., Chagrin Falls, Ohio 44022

Filed Jan. 29, 1976, Ser. No. 653,502
Int. Cl.[2] B29F *1/02*
U.S. Cl. 222—386 23 Claims

1. In combination, a rigid housing for receiving a sleeve having an elongated opening the surface of which is subject to severe conditions in use, a portion of the housing having an elongated aperture surrounded by a substantially thick wall, said aperture having a cross section larger than the cross section of said sleeve opening; said sleeve having the surface of said opening formed of material resistant to said severe conditions, said sleeve being inserted and fixed without bonding within said aperture of said housing and having at least one groove formed in and extending uninterruptedly along the exterior of the sleeve substantially throughout its length but terminating short of an end thereof to form an ungrooved end portion, said groove defining with the adjacent portion of said

aperture wall an elongated cavity between said sleeve and said aperture wall that is closed throughout the length of the groove and that is capable of having explosive material inserted into said cavity substantially throughout its length, the relative strengths of said sleeve and said housing and the cross



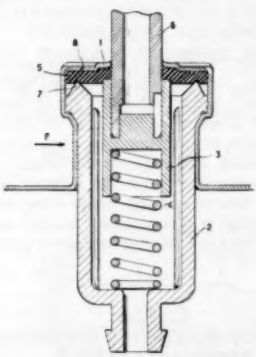
section of said groove being such that when said explosive material in said cavity is detonated said sleeve fractures at said groove and collapses inwardly of said aperture without injury to said housing to permit ready removal of the collapsed sleeve from said aperture in said housing.

4,133,461

HIGH-RELIABILITY VALVE

Jean P. Vercelot, Saint Maur, France, assignor to Aerosol Inventions and Development S.A. AID SA, Fribourg, Switzerland

Filed Mar. 3, 1977, Ser. No. 774,017
Claims priority, application France, Mar. 4, 1976, 76 06111; May 7, 1976, 76 13722
Int. Cl.² B65D *83/14*
U.S. Cl. 222—402.24 **5 Claims**



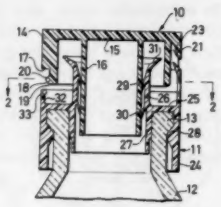
1. An aerosol valve construction including a valve housing, a valve cup in which an upper part of said housing is located, a gasket within said cup between an upper end of said valve housing and a top wall of said cup, means defining a central bore through said gasket and said top wall for a valve-actuating stem and means for compressing said gasket between said upper end of said valve housing and said top wall of said cup at a series of point locations substantially uniformly spaced on a circumference coaxial with said central bore, said compressing means comprising a first wedge-shaped surface on said upper end of said housing and a complementary second wedge-shaped surface on the interior of said top wall of said cup, the respective wedge-shaped surfaces, when viewed axially of said bore, having points of intersection defining said point locations.

4,133,462

CONTAINER CLOSURE

Alrik C. Lindström, Vingåkersplan 12, S-125 40 Älvsjö, Sweden

Filed Oct. 19, 1977, Ser. No. 843,495
Int. Cl.² B65D *39/08*
U.S. Cl. 222—546 **5 Claims**



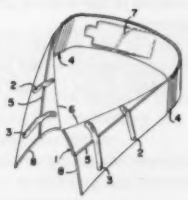
1. A closure means for containers such as bottles, jars and the like, having a mouth which is substantially cylindrical on the inside, said closure means comprising two separate main parts of plastic situated axially in tandem, one main part forming a bottom part which at its lower end is sealingly attachable to the mouth edge of a container, and having interiorly a central, axial tube-like sealing portion which extends downwardly into and seals with a container mouth when said bottom part is attached to a container, said tube-like portion having on its inner surface two axially spaced-apart resilient annular flanges each of which slopes downwardly and radially inwardly, the second main part forming an upper part having a central, axial, outwardly cylindrical sealing stopper portion which is introduced into the tube-like sealing portion such that said flanges grip and seal with the circumference of said stopper portion.

4,133,463

SHIRT COLLAR SUPPORT

Isaac Bourrian, Teniente Benjamin Matienzo 1645, Buenos Aires, Argentina

Filed Dec. 15, 1977, Ser. No. 861,441
Claims priority, application Argentina, Dec. 20, 1976, 265924
Int. Cl.² D06C *15/00*
U.S. Cl. 223—83 **4 Claims**



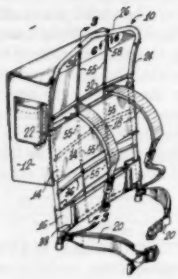
1. A support for a shirt collar for use during storage and display of the shirt, said support comprising an elongated pliable strip including free ends and a medial portion, spaced apart corrugated areas between said medial portion and said free ends, said corrugated areas defining hinge points between said medial portion and said free ends to facilitate bending the latter toward one another and into the desired position to support said collar, said corrugated areas being inclined relative to the longitudinal edges of said strip, said longitudinal edges being parallel to each other between said corrugated areas and diverging relative to each other from a point adjacent said corrugated areas to the tips of the free ends of the strip, and reinforcing means between said corrugated areas and the tips of said free ends.

4,133,464

BACK PACK WITH FLEXIBLE FRAME ASSEMBLY

Asher I. Kelty, Glendale, Calif., assignor to Kelty Pack, Inc., Sun Valley, Calif.

Filed Nov. 12, 1976, Ser. No. 741,333
Int. Cl.[2] A45F 3/00
U.S. Cl. 224—25 A 13 Claims



1. A back pack frame assembly adapted for limited flexing in response to normal use, due to relative hip and shoulder movement of a hiker, comprising:

first and second side bars disposed in spaced and generally parallel relation;

a transverse support bar extending between and connecting said first and second side bars, said support bar and side bars being connected integrally as a unit so as to define a main frame unit, said side bars being connected for limited relative counter-rotational movement about the axis of said transverse bar under normal use conditions to provide flexibility to said main frame unit;

cross bar means including a transversely extending cross bar extending between and interconnecting said side bars; and

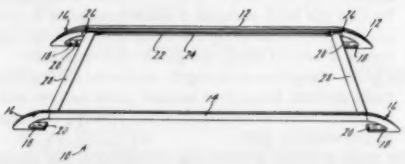
coupling means movably connecting first and second ends of said cross bar to said first and second side bars, respectively, said coupling means including first and second fittings, each fitting being mounted on one end of said cross bar and adapted to engage a corresponding side bar for free pivotal motion thereabout, each said fitting being pivotable about the longitudinal axis of its corresponding side bar when said main frame is flexed under normal use to produce said counter-rotational movement of said side bars.

4,133,465

ADJUSTABLE VEHICLE ARTICLE CARRIER

John A. Bott, 931 Lakeshore Dr., Grosse Point Shores, Mich. 48236

Filed May 19, 1977, Ser. No. 798,579
Int. Cl.[2] B60R 9/00
U.S. Cl. 224—42.1 D 7 Claims



1. In an article carrier for a motor vehicle, an article restraining bar slider assembly comprising:

a slider member;

clamp member associated with said slider member for clamping said slider member in position along a support rail;

fastening means engaging said slider member and said clamp member for moving said clamp member into clamping relationship with said support rail; and

restraining means provided on said slider member for retaining said clamp member upon removal of said fastening means so as to thereby allow said fastening means to be reinstalled with respect to said clamp member without disassembling said slider bar assembly,

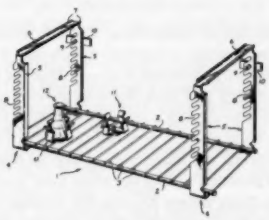
said support rail comprising an elongated member having a longitudinally extending slot provided in a sidewall thereof, said slider member having a guide portion extending through said opening and including oppositely projecting elongated shoulder portions slidingly engaging an interior surface of said sidewall, said retaining means comprising longitudinally spaced abutment means located on the longitudinally opposite sides of said clamp member for limiting relative longitudinal movement of said clamp member with respect to said slider member when said fastening means is disengaged from said clamp member.

4,133,466

TRAY AND RETAINER COMBINATION

Julius S. Rosen, Buffalo, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed Mar. 2, 1977, Ser. No. 773,569
Int. Cl.[2] A47G 23/02
U.S. Cl. 224—48 W 1 Claim



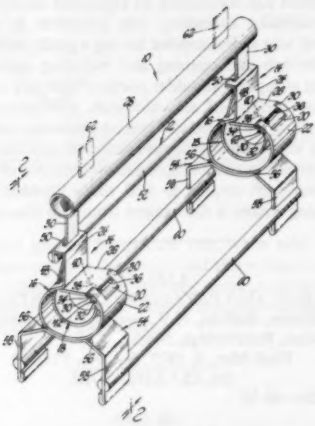
1. A device for transferring a plurality of containers and transmitting repetitious horizontal motion from two reciprocating horizontally-extending carrier members to the containers which comprises in combination:

a bottom, said bottom having a plurality of spaced horizontally-extending parallel members fastened to at least two transverse connecting elements,

support means, said support means including a pair of handles spaced above said bottom, at least one link connecting each said handle to said bottom, each said link being adapted to further supportably engage the respective horizontally-extending carrier member for said device to transmit motion from said carrier members to said bottom, and

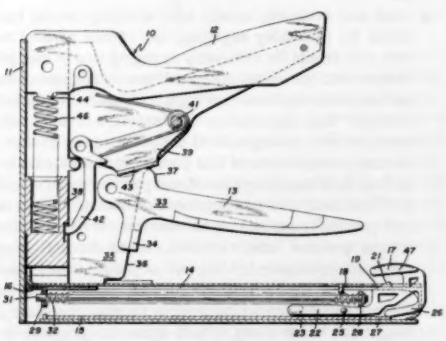
at least one retaining means, said retaining means having means for releasably engaging two of said parallel members, said means for releasably engaging two of said parallel members having an elongated base with a pair of longitudinal ends, said base having a maximum lateral dimension less than the spacing between two of said parallel members and a longitudinal dimension greater than the spacing between two of said parallel members, said longitudinal ends engaging two of said parallel members when said base is rotated to a first position and releasing two of said parallel members upon rotation of about 90° to a second position, said retaining means having gripping means for releasably holding said container at any location intermediate the ends of said parallel members and transmitting motion from said bottom to said container, said longitudinal ends being spaced from said gripping means and said spaced parallel members being held against said gripping means by said longitudinal ends.

4,133,467
GOLF CLUB CARRIER
Frank Mackniesh, Huntington Woods, Mich., assignor to FPD Corporation, Huntington Woods, Mich.
Filed Oct. 31, 1977, Ser. No. 847,333
Int. Cl.[2] B65D 71/00
U.S. Cl. 224—52 **10 Claims**



1. a golf club carrier comprising: a frame including at least one club holder having a bracket which has a lower hook portion; a flexible strap forming a loop within the bracket hook portion for receiving golf club shafts to provide club carrying; the club holder also having a retainer mounted for movement on the bracket hook portion between open and closed postions with respect thereto; the retainer allowing the club shafts to be positioned and retained within the strap loop upon a sideways movement thereinto; means biasing the retainer to the closed position thereof on the bracket hook portion; the club shafts being pulled endways for removal of the clubs from the holder; and a handle connected to the strap so that the strap loop can be tensioned and thereby clamp the club shafts during carrying of the clubs by the carrier.

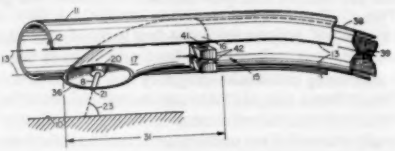
4,133,468
STAPLER
John F. Ewig, Worcester, Mass., assignor to Parker Manufacturing Company, Worcester, Mass.
Filed Oct. 25, 1977, Ser. No. 844,584
Int. Cl.[2] B25C 5/06
U.S. Cl. 227—126 **8 Claims**



1. A stapler, comprising:

(a) a main housing having a grip handle and an operating handle,
(b) an elongated compartment underlying the main housing and extending in the same general direction as the grip handle,
(c) a staple track slidable in and out of an opening in the compartment and having a pusher slidably mounted in the track, and
(d) a latch formed of a bendable plastic mounted in the staple track adjacent the opening in the compartment, the compartment having an upper horizontal wall having an aperture formed therein, the latch having a finger that normally resides in the aperture to prevent the track from leaving the compartment, the latch having an elongated leg extending lengthwise of the staple track and having a laterally-extending peg adjacent its free end that lies in an aperture formed in a side wall of the track.

4,133,469
FURNISHING WELD MATERIAL
Fred A. DeSaw, Columbus, Ohio, assignor to Cooper Industries, Inc., Houston, Tex.
Filed May 9, 1977, Ser. No. 794,886
Int. Cl.[2] B23K 9/12
U.S. Cl. 228—7 **7 Claims**



1. Apparatus for furnishing weld material to a surface for welding thereto along a predetermined welding path, comprising

an elongate guide having a contacting surface substantially uniform in cross section and defining a longitudinal guide path corresponding to the welding path,
means for maintaining the guide in a position with the guide path adjacent to the surface to be welded and in registry with the welding path,
weld material supplying means in controlled contact with the guide and comprising an elongate flexible member having a contacting surface with its cross section shaped to fit slidably in a predetermined position alongside the contacting surface of the guide, a longitudinal opening through the elongate flexible member, and an elongate piece of flexible weld material slidably positioned in and protruding from the opening,
means for moving the weld material supplying means along the guide, and
means for positioning the protruding end of the piece of weld material substantially at a predetermined distance and attitude adjacent to a location on the welding path and feeding the weld material in such manner as to provide a desired weld bead along the welding path as the supplying means is moved along the guide; and wherein
the guide comprises an elongate enclosure having a substantially uniform transverse internal cross section and a substantially uniform longitudinal slot opening corresponding to the welding path,
the guide position maintaining means holds the enclosure in a position with the slot opening adjacent to the surface to be welded and in registry with the welding path,
the weld material supplying means is held slidably in the enclosure and comprises an elongate flexible member partly enclosed by the guide enclosure and having at its welding end a short portion with an external cross section shaped to fit slidably in a predetermined position within the enclosure, and

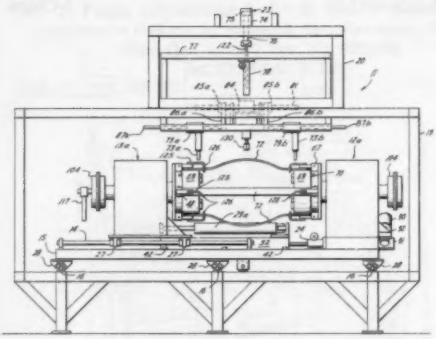
the moving means moves the weld material supplying means longitudinally through the enclosure.

4,133,470

METHOD AND APPARATUS FOR FABRICATING PIPE CENTRALIZER OR THE LIKE

Melvin P. Trail, Houston, Tex., assignor to Chromalloy American Corporation, St. Louis, Mo.

Filed Jun. 22, 1977, Ser. No. 808,900
Int. Cl.² B23K *37/04*
U.S. Cl. 228—44.1 R **20 Claims**



1. In apparatus for fabricating pipe centralizers or the like, the combination comprising:

a pair of opposed coaxially aligned spaced apart mandrels;

means for retaining an end collar of said centralizer on each of said mandrels, including shoulder means attached at the base of each of said mandrels for engaging the axially outer end of said end collar, a collar clamp movably attached to each of said mandrels for axial and radial movement between an open position in which said end collar may be slid over said mandrels and into engagement with said shoulder and a closed position in which said clamp engages the axially inner end of said collar and forces said axially outer end of said end collar against said shoulder, and means for moving said collar clamp between said open and closed positions;

movable support means mounted adjacent to each of said mandrels, said support means being movable between an open position in which said collars may be mounted over said mandrels and a closed position in which the ends of a bow are held in contact with said collars;

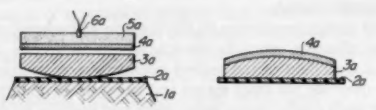
and means for welding the ends of said bow to said collars.

4,133,471

METHOD FOR MAKING CLAD METAL SHEETS HAVING AT LEAST ONE CURVED MAJOR SURFACE

Tooru Niwatukino, Ogoori, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 29, 1977, Ser. No. 792,115
Claims priority, application Japan, Nov. 1, 1976, 51/130422
Int. Cl.² B23K *21/00, 31/02*; B23B *15/00*
U.S. Cl. 228—107 **4 Claims**



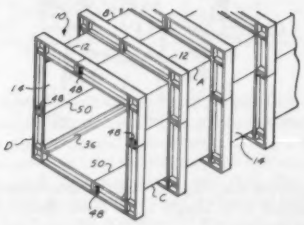
1. A method for making a clad metal sheet comprising explosively deforming a base metal having a first flat surface and a second surface of predetermined curvature against a flat hard plate such that the second surface is made flat and the first surface takes on said predetermined curvature while simultaneously cladding the first surface with a cladding metal sheet by such explosion.

4,133,472

METHOD OF SHIPPING AND ASSEMBLING RECTANGULAR STRUCTURAL UNIT

Herris M. Maxwell, 2204 Riding Ridge Rd., Columbia, S.C. 29204

Division of Ser. No. 768,373, Feb. 14, 1977, abandoned. This application Dec. 8, 1977, Ser. No. 858,742
Int. Cl.² B23K *31/02*; E04B *1/18, 1/35*
U.S. Cl. 228—140 **4 Claims**



1. A method of pre-forming, transporting and assembling a rectangular shaped structural unit, said method comprising the steps of:

(a) forming a plurality of four corner sections, each said corner section being formed by welding two leg members together to extend from said weld in perpendicular relation to one another, with said leg members of each said corner section having an extending length corresponding to the extending length of at least one of other leg members of another corner section;

(b) temporarily connecting said four corner sections into two relatively small transportable units, each transportable unit consisting of two corner sections arranged in a rectangular disposition with the leg members of one corner section disposed in perpendicular relation to at least one of the leg members of the other corner section; and

(c) disconnecting said two transportable units and connecting said four corner sections together to form a relatively large rectangular structural unit in which each leg of each corner section is arranged in extending alignment with at least one leg member of another corner section.

4,133,473

METHOD FOR BRAZING FERROMAGNETIC MATERIALS

Vladislav D. Tabelev, ulitsa Saksaganskogo, 110, kv. 20; Leonid G. Puzrin, ulitsa Borschagovskaya, 16, kv. 98; Vladimir M. Kaschenko, ulitsa Naberezhno-Lugovaya, 5, kv. 36; Vyacheslav A. Beletsky, Bulvar Lesi Ukrainki, 5, kv. 78, and Valentin A. Blanin, ulitsa Krasnoarmeiskaya, 14, kv. 13, all of Kiev, U.S.S.R.

Continuation of Ser. No. 647,458, Jan. 7, 1976, abandoned. This application Oct. 17, 1977, Ser. No. 842,689
Int. Cl.² B23K *1/04*
U.S. Cl. 228—215 **6 Claims**

1. A brazing method for joining ferromagnetic materials separated by a gap comprising:

filling said gap with a finely divided metalloceramic braze containing a ferromagnetic refractory component and a fusible component, wherein said fusible component has a melting point lower than the Curie point of said refractory component; imposing a magnetic field whose lines of force cross the gap, the intensity of said magnetic field being sufficient to retain the ferromagnetic refractory compo-

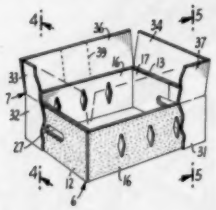
nent within the gap during the brazing process; heating the joining zone including the gap to a temperature less than the Curie point but sufficient to melt the fusible component; and cooling the joining zone.

4,133,474

STACKING BOX CONSTRUCTION USING GLUED SIDES

Richard A. Hall, Danville, Calif., assignor to Willamette Industries, Inc., San Leandro, Calif.

Filed Nov. 23, 1977, Ser. No. 854,359
Int. Cl.[2] B65D *13/00*
U.S. Cl. 229—23 R **1 Claim**



1. An improved stacking box construction comprising a tray element adapted to fit snugly in an outer sleeve element, the tray element having

(a) a bottom panel with side panels extending along opposite sides thereof and end panels extending along opposite ends thereof, said end panels each having a handhold defined therein and being attached to said bottom panel by a scoreline and being movable on the bottom panel, each side panel having an intermediate side panel portion with movable side end panels attached by second scorelines at each end thereof, each intermediate side panel having a plurality of ventilation apertures defined therein and being movable on the bottom panel and each side end panel having a cut away portion defined therein at an end thereof remote from said second scorelines and being movable on the intermediate side panel into a face-to-face engagement with each movable end panel, said handholds being located on said end panels and said cut aways being located on said movable side end panels to be coincident with each other when said movable side end panels are in face-to-face engagement with said end panels with said cut aways each being about half the length of a handhold and said movable side end panels each being about half the length of an end panel so that said movable side end panels and said end panels form a double thickness wall, said cut aways surrounding said handhold, each of the panels on the bottom panel being of the same height relative to the bottom panel;

(b) a sleeve element formed into rectangular form to fit as a sleeve about the assembled tray element in which abutting panels on the sleeve element fit snugly against corresponding panels on the tray element in a full face-to-face abutment with the panels on the assembled tray element;

(c) the sleeve element having a pair of side panels each having a plurality of ventilation apertures defined therein which correspond to the ventilation apertures defined in said tray element, a pair of end panels each having a handhold defined therein to correspond to said tray handholds, top panels, and said top end panels being connected to said sleeve by sleeve scorelines to be movable to provide a closure for the assembled sleeve and tray element;

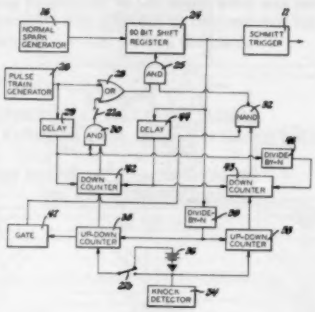
(d) and an adhesive interposed between the abutting faces of the elements making up the tray and the abutting faces of the elements making up the sleeve, the adhesive effectively joining the sleeve and tray elements into a unitary container, said unitary container having end walls each of which has a triple thickness throughout and handholds therein, side walls each of which has a double thickness throughout and ventilation apertures defined therein and a single thickness bottom so that said unitary container has improved stacking strength.

4,133,475

ENGINE SPARK TIMING SYSTEM WITH KNOCK RETARD AND WIDE OPEN THROTTLE ADVANCE

John L. Harned, Grosse Pointe Woods, and Thomas C. Wolanzyk, Howell, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 17, 1977, Ser. No. 759,720
Int. Cl.[2] F02P *5/04*
U.S. Cl. 123—117 D **2 Claims**



1. A spark timing system for an internal combustion engine having a crankshaft, a plurality of spark plugs to which ignition pulses are successively applied as the crankshaft rotates and fuel charge delivery apparatus including a throttle having a wide open position corresponding to the maximum rate of fuel charge delivery to the engine, comprising in combination:

first means responsive to engine knock and effective to generate an excessive knock output signal when the knock as detected by said first means exceeds a reference and an acceptable knock signal when the knock as detected by said first means does not exceed the reference;

a first counter responsive to the first means and triggered by selected ignition pulses to increase its count when the first means generates an excessive knock signal and to decrease its count when the first means generates an acceptable knock signal;

second means to generate a spark timing pulse for each spark ignition event, each said pulse having a predetermined timing determined by mechanism not directly responsive to engine knock;

third means responsive to the second means to generate an ignition pulse for each spark timing pulse and effective normally to retard each ignition pulse from each spark timing pulse by a first constant angle of crankshaft revolution plus an additional second angle of crankshaft revolution proportional to the count of the first counter;

a second counter responsive to the first means and triggered by selected ignition pulses to decrease its count when the first means generates an excessive knock signal and to increase its count when the first means generates an acceptable signal;

fourth means responsive to the throttle and second counter and effective, when the throttle is in its wide open position and the count of the second counter is greater than zero, to override the third means and generate an ignition pulse for each spark timing pulse, each said ignition pulse being retarded from its respective spark timing pulse by the constant first angle of crankshaft revolution less a third angle of crankshaft revolution proportional to the count of the second counter, whereby spark timing may be advanced from a normal spark timing, as determined by the spark timing pulses and the constant first angle of

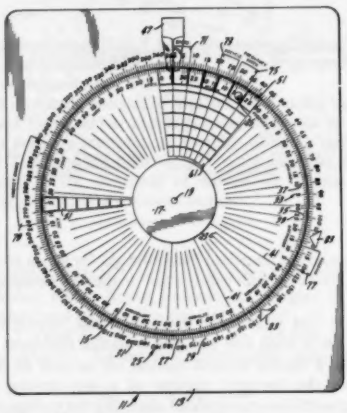
crankshaft revolution, during wide open throttle, to increase maximum engine power but is retarded from the normal or advanced timing as necessary to limit engine knock.

4,133,476

VISUAL DISPLAY CALCULATOR

Roy L. Poage, and Michael A. Jewell, both of Sycamore, Ill., assignors to DeKalb Ag Research, Inc., Sycamore, Ill.

Filed Dec. 9, 1977, Ser. No. 859,021
Int. Cl.[2] G06C 3/00
U.S. Cl. 235—85 FC 3 Claims



1. A calculator for use in planning the orderly production of swine throughout a calendar year including:

a base,

a disc rotatably mounted on said base about its center,

a circular scale formed on said base around the outer edge of said disc,

said circular scale having 365 equally spaced marks numbered in sequence around the scale,

a circular scale formed at the outer edge of said disc and having indicia indicating the months of the year with each month having indicia indicating the days of the month,

the sequence of the indicia on the disc scale running in the opposite direction of rotation to the sequence of indicia of the base scale,

an alignment indicator overlying said scales and aligned with the indicia number 1 on the base scale,

a series of spaced, circumferentially extending bands superimposed on the indicia of said base scale with the location of each band on the base scale and its arcuate extent corresponding to a time period in the breeding and growing cycle of swine which is significant for production purposes,

a series of trapezoidal shaped films releasably adhereable to said disc and adapted to be positioned with the longer end edges of the trapezoidal films located adjacent the peripheral edge of the disc and the tips of the trapezoidal films extending towards the center of the disc,

each trapezoidal shaped film having a longer end edge with a length equal to the spacing of seven indicia of the scale on said disc,

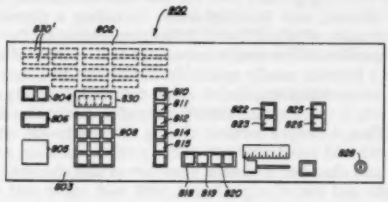
a transparent portion located at the longer end edge of the trapezoidal film with the remainder of the trapezoidal film being subdivided into information receiving segments.

4,133,477

FAULT DETECTION AND SYSTEM FOR ELECTROSTATOGRAPHIC MACHINES

Joseph A. Marino; Gary A. Gray, both of Fairport, and Edward Steiner, Macedon, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 15, 1976, Ser. No. 677,472
Int. Cl.[2] G06F 11/00
U.S. Cl. 235—304 8 Claims



1. In a reproduction system having a plurality of copy processing components cooperable to produce copies and a controller for operating said components in accordance with a program to produce copies, said program incorporating a fault flag array, each flag comprising said fault flag array being associated with an individual fault, and plural fault sensors for detecting faults during operation of said copy processing components, each of said fault sensors being associated with a predetermined one of said fault flags in said fault flag array, each of said fault sensors setting the fault flag associated therewith in response to detection of a fault by said sensor, the improvement comprising:

means to initiate scanning of said array of fault flags;

means for generating a preset fault signal for each fault flag set; and

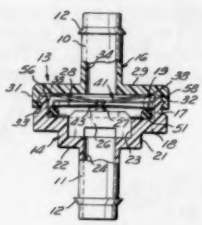
display means responsive to said preset fault signals to identify the fault represented by any fault flag in said array that has been set.

4,133,478

TEMPERATURE RESPONSIVE VALVE

Donald E. Place, Mansfield, Ohio, assignor to Therm-O-Disc Incorporated, Mansfield, Ohio

Filed Feb. 7, 1977, Ser. No. 766,147
Int. Cl.[2] G05D 23/10
U.S. Cl. 236—48 R 11 Claims



1. A temperature responsive valve comprising a body member having a valve cavity therein providing a lateral wall and an end face, said body being formed with an upstanding generally cylindrical flange providing said lateral wall and end face, a closure member closing said cavity and cooperating with said valve cavity to define a valve chamber, said closure member providing a recess enclosing the end face of said cylindrical flange, a valve seat in said chamber, a bimetal snap disc in said chamber movable into and out of engagement with said valve seat in response to changes in temperature, and a spring positioned against said disc on the side thereof opposite said seat and operable to urge said disc in a direction toward said seat,

said spring including locating means engaging said lateral wall and operating to locate said spring during assembly of said closure member and said body member, said locating means preventing said spring from being trapped between said end face of said cylindrical flange and said closure member, said spring being formed of sheet material providing a central portion and a plurality of symmetrically arranged inclined projections which extend from said central portion and engage said closure member at their free ends to urge that central portion into engagement with the said disc substantially at the center thereof, said locating means including a plurality of symmetrically arranged lateral projections extending from said central portion to free ends substantially adjacent to said lateral wall at a location axially spaced from said end face.

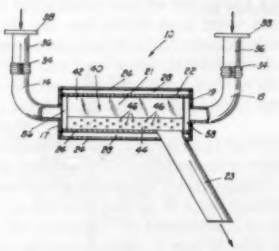
6. A temperature responsive valve comprising a body member having a valve cavity therein providing a lateral wall and an end face, a closure member closing said cavity and cooperating with said valve cavity to define a valve chamber, a valve seat in said chamber, a bimetal snap disc in said chamber movable into and out of engagement with said valve seat in response to changes in temperature, and a spring positioned against said disc on the side thereof opposite said seat and operable to urge said disc in a direction toward said seat, said spring including locating means engaging said lateral wall and operating to locate said spring during assembly of said closure member and said body member, said spring being formed of sheet material providing a central portion and a plurality of symmetrically arranged inclined projections which extend from said central portion and engage said closure member at their free ends to urge that central portion into engagement with said disc substantially at the center thereof, said locating means including a plurality of symmetrically arranged lateral projections extending from said central portion to free ends substantially adjacent to said lateral wall at a location axially spaced from said end face.

4,133,479

EXHAUST GAS MUFFLER FOR AN INTERNAL COMBUSTION ENGINE

Charles M. Musitano, c/o K.M.R. Industries, Inc., 4 Valley View Dr., Goddard, Kans. 67052, and Robert B. King, c/o Mrs. Burns King, N. "C" St., Wellington, Kans. 67152

Filed Aug. 22, 1977, Ser. No. 826,529
Int. Cl.[2] B60H *1/02*
U.S. Cl. 237—12.3 A **7 Claims**



1. An exhaust gas muffler for an internal combustion engine, the muffler comprising:

an enclosed cylindrical core can forming a core can chamber therein, said core can having a first end and a second end;

a sound attenuator disposed inside said core can chamber, said attenuator including;

more than one divider plate extending along the length of said core can and parallel thereto, said plates attached to the interior wall of said can and including a plurality of apertures therein for receiving exhaust gas therethrough, said plates dividing said can chamber into three separate chambers which include a first intake chamber, a second intake chamber, and a discharge chamber;

a plurality of intake pipes attached to said core can and communicably connected to said first and second intake chambers for discharging exhaust gas therein; and

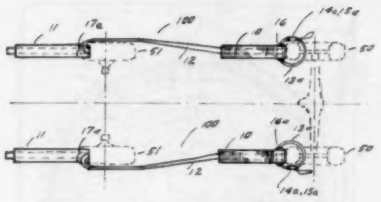
a discharge tail pipe attached to said core can and communicably connected to said discharge chamber for receiving the exhaust gas therefrom.

4,133,480

CONVENIENCE ANTI-WHEEL SPIN DEVICE FOR RUBBER TIRED VEHICLES INCLUDING A WINCHING ACCESSORY

Thorvald G. Granryd, 825 N. Sheridan Rd., Lake Forest, Ill. 60045

Continuation-in-part of Ser. No. 640,254, Dec. 12, 1975, abandoned. This application May 16, 1977, Ser. No. 796,875
Int. Cl.[2] E01B *23/00*
U.S. Cl. 238—14 **12 Claims**



10. A method of installing a traction aid for use in extricating a vehicle mired in mud, snow, sand or the like comprising the steps of

placing a first elastomeric anchoring mat having corrugations on at least one side and a wedge abutment portion having a recess formed therein on an end of said mat against the forward portion of a non-driving vehicle wheel with the corrugations engaging the surface supporting the vehicle and the wedge abutment portion with the recess formed therein in contact with the non-driving vehicle wheel,

placing a second elastomeric traction mat coupled to said first elastomeric anchoring mat by a flat and flexible connector and having corrugations on one side and a tapered portion on an end thereof against the forward portion of a power driven vehicle wheel with the corrugations and the tapered portion engaging the power driven vehicle wheel, and

folding the flat flexible connector joining the first and second elastomeric anchoring and traction mats toward the first anchoring mat into the recess formed in the wedge abutment then transverse to the non-driving vehicle wheel to a position on an outer side thereof and then along the outer side of the non-driving wheel toward the second elastomeric traction mat thereby firmly holding both mats in position while the vehicle is extricated.

4,133,481

ANTI-SKID DEVICE FOR VEHICLES

Leslie B. Bennett, 1403 Selinger Ave., Erie, Pa. 16505

Filed Dec. 19, 1977, Ser. No. 861,530
Int. Cl.[2] E01B *23/00*; B32B *3/00*
U.S. Cl. 238—14 **4 Claims**

1. A traction device comprising,

a relatively rigid, substantially flat elongated mat made of thermo-plastic material and having a width substantially wider than the width of a pneumatic tire of a motor vehicle,

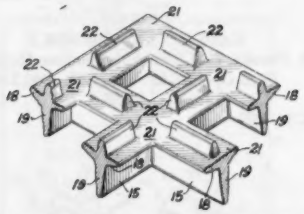
said mat having a traction area defining approximately one-half of the length of said mat and an approach area and a departure area at each end of said traction area,

said approach area and said traction area being defined by

ribs extending parallel to the said ends of said frame and integrally connected together to said frame,

the said traction area having ribs extending at approximately 45° angles to said sides and to said ends of said mat and intersecting each other at 90° angles and integrally connected together at their point of intersection,

said ribs being generally T-shaped in cross-section having a vertical leg and a horizontal leg,



said vertical leg of said T being generally elliptical in shape and said horizontal legs of said T's being generally elliptical in shape having a flat top surface,

spaced upwardly extending lugs are fixed to the top surface of said T-shaped bar, said lugs being separated by spaces at their point of intersection, thereby allowing said parts of said T-shaped bars above said horizontal bar to be deformed in the direction of movement of said vehicle, thereby providing greater traction.

4,133,482

RINSING DEVICE FOR PERSONAL HYGIENE

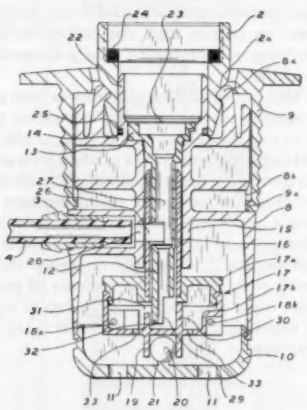
Michel Moret, Chene-Bourg, Switzerland, assignor to Les Produits Associes Lpa SA, Geneva, Switzerland

Filed Jan. 21, 1977, Ser. No. 761,269

Claims priority, application Switzerland, Jan. 21, 1976, 708/76

Int. Cl.² B05B *1/08*

U.S. Cl. 239—101 **12 Claims**



1. A rinsing device for personal hygiene, particularly for a mouth wash, comprising an outlet nozzle and flexible tube assembly connected thereto, a liquid pulse generator having an inlet having pressure water passage and first coupling means for passage to a pressure water source, an outlet, and further coupling means for connecting the outlet nozzle and flexible tube assembly, a first rotary valve having a rotary part mounted between the pressure water passage and the outlet and being adapted to be set in rotation and which is adapted to close the outlet intermittently to produce a pulsating jet of liquid, a turbine coupled with the rotary valve and adapted to drive the rotary valve, the turbine provided with at least one tangentially oriented jet opening provided at its periphery, the jet opening being in communication with the pressure water passage, a conduit leading from the pressure water passage and the jet opening, a further rotary valve disposed in the conduit, the further rotary valve having a rotating part connected to the rotating part of the first rotary valve, the further rotary valve adapted to block this conduit intermittently each time at least approximately during that interval of time when the first rotary valve is passing through its open position.

4,133,483

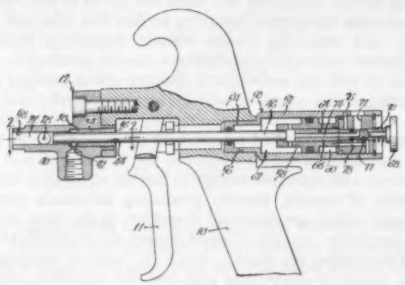
PLURAL COMPONENT GUN

David Henderson, Darien, Conn., assignor to Binks Manufacturing Company, Franklin Park, Ill.

Filed Jul. 5, 1977, Ser. No. 812,584

Int. Cl.² B05B *7/04*

U.S. Cl. 239—118 **6 Claims**



1. A plural component mixing and dispensing gun comprising a gun body having a trigger; a head secured to the body; said head having a mixing chamber with a discharge outlet at its forward end; inlet orifices communicating with said chamber; trigger actuated means for intermittently feeding streams of reactant liquids through said orifices into said chamber so that the liquids form a reactive mixture which is discharged through said discharge outlet; said head having an opening axially aligned with said chamber rearwardly thereof; a purging rod received in said opening; means for biasing said rod to a normally retracted position rearwardly of said orifices; and means independent of said trigger actuated feeding means for selectively moving said rod forwardly through said chamber in a chamber purging stroke.

4,133,484

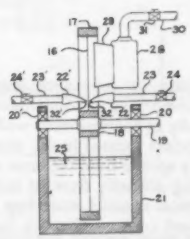
APPARATUS FOR SPRAYING LIQUIDS IN MONO-DISPERSED FORM WITH CAPACITY TO CONTROL THE QUANTITY OF SPRAY

Joseph Jannone, 133-48 84th St., Ozone Park, N.Y. 11417

Filed Jun. 7, 1976, Ser. No. 693,790

Int. Cl.² B05B *3/02*

U.S. Cl. 239—214.25 **12 Claims**



1. An apparatus for dispersing liquids into a gaseous medium in the form of a mono-dispersed spray having capacity to control the quantity of liquid dispersed comprising, in combi-

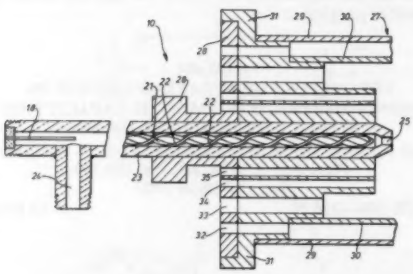
nation, a liquid receiving receptacle, an elongated free film rupturing gas emitter, a rotatable cylinder accommodating a mono-layer "porous" material adapted for conveying liquid from said receptacle to the proximity of said gas emiter, and a surface film removing means for completely removing surface film from said "porous" material prior to having said material in the proximity of said gas emitter, said surface film removing means including means providing a pair of directly opposed wedge like nozzles providing a wedge like slotted opening adapted to emit a wedge like fluid stream substantially tangentially with respect to said material and toward said surface film; means for supplying a liquid to said receptacle, said means including means regulating flow into said receptacle at a rate sufficient to maintain contact with said "porous" material moving in said receptacle; means comprising the characteristic of the "porous" material acting on the liquid to form thin, stressed free films in the openings of said material upon emerging devoid of surface film from the liquid in said receptacle, and upon completely removing surface film from said material by said removing means whence containing surface film thereon; means for introducing a gaseous medium to the interior of said gas emitter at a pressure above ambient pressure acting on the outside of said gas emitter whereby said medium is caused to be emitted outwardly from the interior of said emitter and directed substantially perpendicular to the "porous" material and transverse to the direction of said material travel with sufficient energy to further stress said films to the point of rupture, thereby producing minuscule particles of liquid which are dispersed therefrom in the form of a spray; wherein the quantity of liquid dispersed is controlled by means of controlling the speed at which the "porous" material moves, by means of controlling said free film rupturing gas emitter stream width in the direction transverse to the direction of said material travel, and by means of the two foregoing means for controlling the quantity of liquid dispersed.

4,133,485

ATOMIZER AND USES THEREOF

Jacques Bouvin, Saint Martin du Vivier, France, assignor to Esso Societe Anonyme Francaise, Paris, France

Filed Aug. 16, 1976, Ser. No. 714,370
Claims priority, application France, Aug. 27, 1975, 75 26350
Int. Cl.² B01F *13/04;* B05B *1/34*
U.S. Cl. 239—399 **6 Claims**



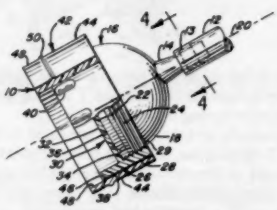
1. An apparatus for mixing or atomizing fluids without moving parts, comprising in combination: a hollow tube having a substantially cylindrical inner wall; a core member having an outer surface located in the tube substantially coaxial with but slightly spaced from the inner wall, the core member having extending inwardly from its surface at least one non-intersecting helical channel extending substantially continuously around said core member for its length; and channel-forming means secured to the core member and extending round and for the length of the core member in substantial continuous contact with said outer surface and also being in frictional contact with said inner wall such that said core member and said channel forming means are removably secured essentially only by force-fit contact with said hollow tube as an integral unit, said channel-forming means comprising one layer of at least one non-intersecting helical winding opposite to said first helical direction, the direction of each winding in said layer being opposite to the direction of each channel in said core member.

4,133,486

HAIR SPRAY ASSEMBLY

Michael R. Fanella, 2111 Kenicott, Arlington Heights, Ill. 60004

Filed Oct. 28, 1977, Ser. No. 846,336
Int. Cl.² B05B *1/28*
U.S. Cl. 239—499 **11 Claims**



1. A hair spray assembly particularly adapted for permanent waving, shampooing and frosting of the hair, comprising:

a flexible hose;

a portable nozzle having a tubular inlet telescopically coupled to said flexible hose and having a body with a diverging mouth defining an outlet communicating with said tubular inlet;

a shower head having an annular flange for securely engaging said body, a disc extending from said flange and covering said outlet, said disc having a front face, a back face adjacent said flange and defining an array of fluid flow apertures communicating with said nozzle for emanating a spray, and an arcuate rigid rim portion at least partly circumscribing and projecting axially forwardly of said front face; and

an annular skirt circumscribing said shower head and including an engaging portion intimately contacting and fixedly secured to said flange and a lip portion axially extending from said engaging portion to a position forwardly of said rigid rim portion for generally limiting the divergence and radial projection of said spray emanating from said spray head into a generally cylindrical zone, said lip portion being resilient and substantially more flexible than said rigid rim portion for matingly engaging and sealingly conforming to hair and to the contours of portions of a permanent wave rod and a frosting cap to substantially prevent splashing and dripping of said spray outside of said spray zone.

4,133,487

METHOD AND APPARATUS FOR COMMINUTING SOLID PARTICLES IN A FLUID STREAM

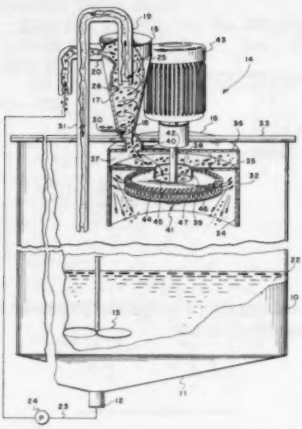
Juan E. Lanier, Dallas, Tex., assignor to Ferguson Industries, Inc., Dallas, Tex.

Filed Jun. 30, 1977, Ser. No. 811,946
Int. Cl.² B02C *23/08*
U.S. Cl. 241—5 **11 Claims**

1. The method of comminuting solid bodies suspended in a liquid comprising the steps of:

(a) substantially separating said liquid into a stream containing larger solid bodies and a stream containing smaller solid bodies;

(b) accelerating said stream containing the larger bodies to a velocity of approximately 150 mph; and



(c) directing said accelerated stream against a rigid substantially immobile wall, thereby to fracture and comminute said larger solid bodies.

4,133,488

ROLLER MILL WITH REMOVABLE SEPARATOR STRUCTURE

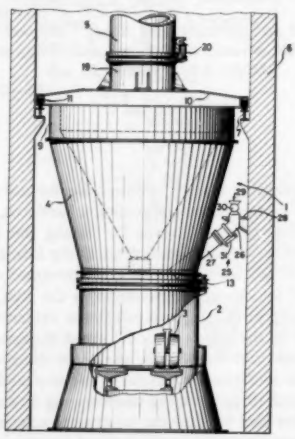
Otto Heinemann, Ennigerloh; Heinz-Herbert Schmits, Rheda-Wiedenbruck, and Heinz-Dieter Baldus, Ahlen, all of Fed. Rep. of Germany, assignors to Polysius AG, Neubeckum, Fed. Rep. of Germany

Filed Aug. 29, 1977, Ser. No. 828,277

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1976, 2641620

Int. Cl.² B02C *23/10*

U.S. Cl. 241—79 **7 Claims**



1. A roller mill including a mill housing with mill rollers therein, a separator positioned above said mill housing, and an exhaust air duct positioned above said separator, the combination therewith of track means extending from adjacent said roller mill to a position beyond said roller mill for supporting said separator and for guiding said separator horizontally from between said mill housing and said exhaust duct, whereby said separator can be removed from between the mill housing and the exhaust duct and moved along the track until the mill rollers in the mill housing are accessible to a crane or the like movable along the same track.

4,133,489

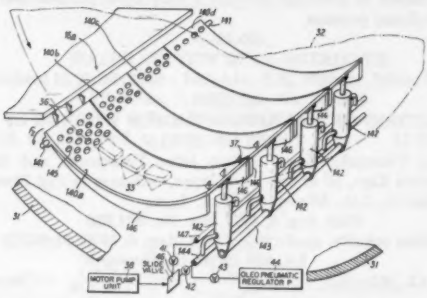
SHREDDERS, NOTABLY FOR PROCESSING HETEROGENEOUS MATERIALS

Edgard J. Maillet, Domaine de l'Ermitage Ludon Medoc, 33290 Blanquefort, France

Filed May 16, 1977, Ser. No. 797,167

Int. Cl.² B02C *13/284*

U.S. Cl. 241—89 **2 Claims**



1. In a comminuting apparatus of the type having a rotor carrying knives which cooperate with stationary knives supported on a cage concentric with and extending around the upper portion of the rotor, a grate formed of a plurality of perforated semi-cylindrical contiguous segments each pivoted at one end on a common axle parallel to the axis of the rotor;

an equal number of hydraulic jacks, one supporting the opposite end of each of said segments respectively;

means for raising said jacks in unison to pivot said segments about said axle between a lower position in which said grate is concentric with the rotor and an upper position in which the jack end of the said grate is closer to the surface of the rotor than the pivot end; and

means for connecting said jacks when in their upper position to a source of constant pressure to resiliently support said grate in said upper position.

4,133,490

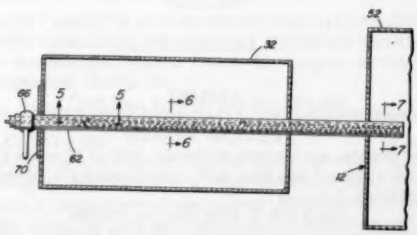
MACHINE FOR MAKING CELLULOSE INSULATION

Joseph E. Jackson, Winchester, Ind., assignor to Lewis E. Jones and Forrest E. McMahan, both of Anderson, Ind., part interest to each

Filed Jul. 13, 1977, Ser. No. 817,026

Int. Cl.² B02C *23/02*

U.S. Cl. 241—101.6 **5 Claims**



1. In a cellulose insulation making apparatus of the type having means for grinding raw paper into desired size particles, in which chemical additive of the powder-type is combined with the ground paper, that improvement comprising a screw auger means forming the sole means for feeding and

metering a quantity of powder-type chemical additive into the grinder means for homogenous application to the paper particles, and screw auger means conveying the final product from the grinding means, wherein said feeding and metering screw auger means includes a hopper for powder-type chemical additive, a screw auger shaft with spiral flighting thereon extending through the bottom portion of the hopper, a housing for said shaft, said housing including air inlet opening in the top portion thereof, adjustable closure means for variably closing off said opening for varying the quanity of material passing therethrough and variable setting means for setting said closure means at positions between a fully open position and a fully closed position.

4,133,491

METHOD OF AND APPARATUS FOR WINDING UP TAPES ON REELS

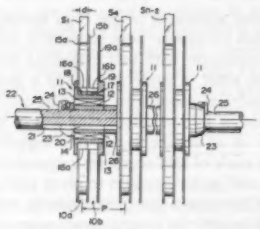
Tuneo Yamazaki; Kaoru Shiino; Akira Yamaguchi, and Toshihiro Kato, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 4, 1977, Ser. No. 821,916

Claims priority, application Japan, Aug. 6, 1976, 51-94372

Int. Cl.[2] B65H *19/04*

U.S. Cl. 242—56.9 **6 Claims**



1. A method of winding up a number of tapes on a number of reels simultaneously comprising preparing a number of reel groups each consisting of a plurality of reels arranged in side by side relation, the number of said reel groups being equal to the number of tapes to be wound up simultaneously, mounting said reel groups on a plurality of shafts extending in parallel to each other in such a manner that said tapes may be simultaneously wound up on corresponding reels of said reel groups, winding up said tapes simultaneously on first reels of said reel groups, cutting the tapes when the tapes are fully wound up on said first reels, axially shifting said reel groups on shafts up to a position where the second reels of the reel groups come to the positions formerly occupied by the first reels, and winding up the tapes simultaneously on said second reels of the reel groups.

4,133,492

CLOSED PNEUMATIC LOAD-APPLYING DEVICE FOR THREAD BRAKES

Josef Derichs, and Gerhard Koslowski, both of Monchen-Gladbach, Germany, assignors to W. Schlafhorst & Co., Monchen-Gladbach, Germany

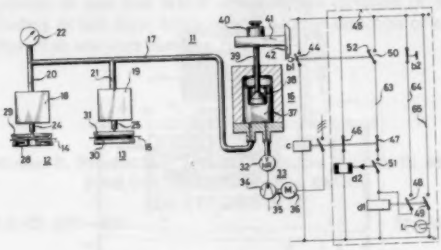
Filed Feb. 3, 1978, Ser. No. 874,891

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1977, 2704874

Int. Cl.[2] B65H *59/10*

U.S. Cl. 242—150 R **5 Claims**

1. Assembly comprising a closed pneumatic device for applying a load to a thread brake for braking a thread traveling therethrough, said load-applying device including means for storing pressure at a variable volume, and means operatively connected to said closed pneumatic load-applying device for



determining and signaling a detrimental pneumatic leakage loss in said load-applying device.

4,133,493

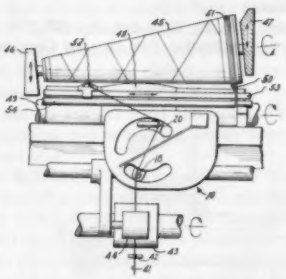
SELF-THREADING TENSION COMPENSATOR

Richard A. Schewe, Loves Park, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed Apr. 3, 1978, Ser. No. 892,552

Int. Cl.[2] B65H *59/26*

U.S. Cl. 242—154 **6 Claims**

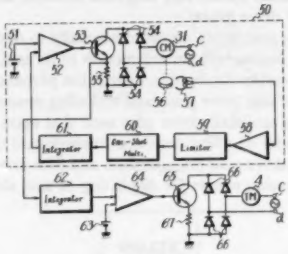


1. A self-threading tension compensator for use in package winding, said compensator comprising a fixed axis, a member rotatable about said axis, means for biasing the member to rotate in a predetermined direction about the axis, a stop limiting rotation of said member in the predetermined direction, a projection of said member spaced from the axis, a smooth thread-engaging surface on said projection extending substantially parallel to the axis, a smooth thread-engaging shoulder extending from said member in the same direction as said projection and substantially parallel to said axis, and characterized by a smooth thread-guiding ramp sloping downward from a position over and beyond the outermost extremity of said shoulder in opposite to the predetermined direction of rotation, and a thread-guide cantilevered in a fixed spaced relation to the axis at a location adjacent and beyond the motion limiting position of said shoulder with respect to the axis, said thread-guide passing between and extending across the paths of said projection and said shoulder, an outside of said thread-guide farther from said member than the outermost extremities of said projection and said ramp, said thread-guide terminating in a free end farther from the axis than said projection in motion limiting position.

4,133,494
TAPE DRIVING APPARATUS

Katsuyoshi Nukui, Mitaka, Japan, assignor to Nippon Columbia Kabushikikaisha, Tokyo, Japan

Filed Jun. 17, 1977, Ser. No. 807,675
Claims priority, application Japan, Jun. 24, 1976, 51-82995[U]; Mar. 19, 1977, 52-30830
Int. Cl.² B65H *59/38*; G03B *01/04*
U.S. Cl. 242—186 **6 Claims**

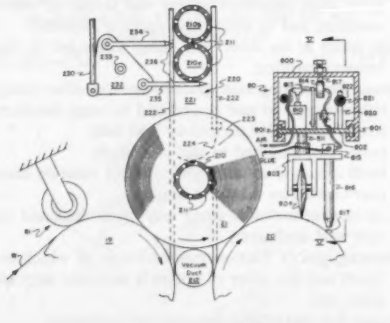


1. A tape driving apparatus, comprising:
(a) a reel motor for driving a supply reel on which a magnetic tape is wound;
(b) a capstan for transporting said tape at a constant speed;
(c) a servo motor for driving said capstan;
(d) a reel motor for driving a take-up reel which takes up said tape;
(e) a first control means for controlling the speed of said servo motor to maintain said speed substantially constant; and
(f) a second control means for controlling the voltage applied to at least one of said reel motors to maintain the current flowing through said servo motor substantially constant.

4,133,495
STRETCHABLE MATERIAL REWINDING MACHINE

Daniel J. Dowd, Williamsport, Pa., assignor to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 750,469, Dec. 14, 1976, Pat. No. 4,103,840. This application Jan. 6, 1978, Ser. No. 867,232
Int. Cl.² B65H *17/12, 75/28*
U.S. Cl. 242—66 **3 Claims**

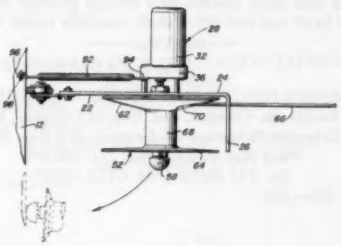


1. A stretchable web material winding machine comprising:
A. Cylindrical reel mandrel means having a perforated wall annulus axially surrounding an open conduit bore and at least one of distally opposite axial ends thereof open;
B. A reel winding station having surface drive means for supporting and rotating said mandrel means about the axis thereof;
C. Mandrel guide means for receiving and confining said opposite mandrel ends in channelways for confinement in all directions except along the length of said channelways, said channelway length projecting from said surface drive means along a displacement line followed by said mandrel ends as a building reel of said material radially grows thereabout;
D. A fixed position aperture positioned within at least one of said channelways and located to axially align with said open mandrel bore end in the absence of said material reeled thereabout; and,
E. Vacuum conduit means connecting vacuum source means with said aperture.

4,133,496
WATER SKI TOW ROPE RETRIEVER

Richard H. Zetah, 1005 - 14th Ave., S.E., Willmar, Minn. 56201

Filed Nov. 7, 1977, Ser. No. 849,395
Int. Cl.² B65H *75/40*
U.S. Cl. 242—86.5 A **12 Claims**



1. A reel assembly including a mount, a reel journaled from said mount, said reel including a center hub portion and end flange means at one end of said hub portion including inner and outer sides, said mount further including anchor structure generally concentric with the axis of rotation of said reel and disposed on the outer side of said flange means, said flange means defining an opening therethrough, an elongated, flexible pull member for winding on and unwinding from said reel, one end of said pull member being passed through said opening from the inner side of said flange means to the outer side thereof and anchored to said anchor structure for rotation of said one end relative to said anchor structure about said axis with said reel, said opening being disposed on a radius of said axis and defining a passage through which said pull member may extend in substantially straight condition from said anchor structure to a point remote from said reel when the other end portion of said pull member is unreeled from said reel and extends generally radially outwardly therefrom.

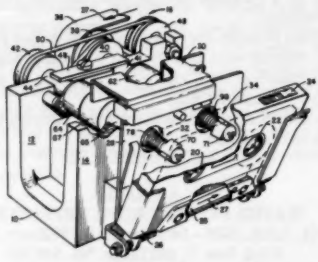
4,133,497
TAPE CASSETTE DRIVE INCLUDING MEANS FOR REDUCING TAPE TRANSPORT START-UP SHOCK

Kurt Rothlisberger, Morton Grove, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Dec. 5, 1977, Ser. No. 857,335
Int. Cl.² G03B *1/04*; F16D *3/14*
U.S. Cl. 242—200 **7 Claims**

1. In an apparatus for driving the spools of a tape cassette including a shaft carrying a head positioned thereon and adapted to engage one of the cassette spools the head being slidable along the shaft and biased into a predetermined axial position on the shaft, the improvement comprising:
means for limiting rotational movement of the head coaxially with respect to the shaft between a first position and a second position arcuately spaced from said first position, said first and second positions defining an arcuate segment of the shaft; and

means for biasing said head to said first position so that the initial movement of said head with respect to said shaft upon start-up is against the force of said biasing means



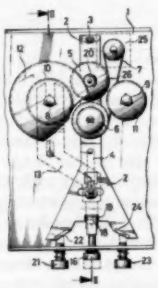
thus allowing initial relative movement of said head with respect to said shaft against the bias of said biasing means until said head reaches said second position whereupon said head and said drive shaft coaxially rotate in unison.

4,133,498

DRIVE DEVICE FOR A TAPE RECORDER

Helmut Laufer, St. Georgen, Fed. Rep. of Germany, assignor to Dual Gebruder Steidinger, St. Georgen, Fed Rep. of Germany

Filed Nov. 4, 1977, Ser. No. 848,598
Int. Cl.[2] G03B *1/04*; G11B *15/32*
U.S. Cl. 242—201 5 Claims



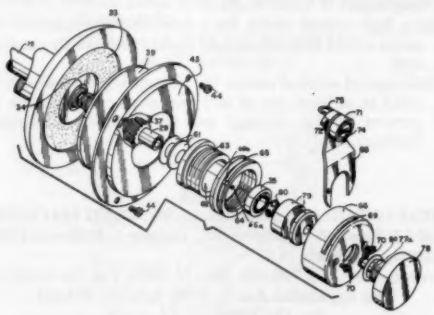
1. A tape recorder, comprising
a first winding spindle and a second winding spindle for receiving respective spools of a recordable tape rewindable from one of the spools onto a second of the spools,
a first drive gear coaxially connected with said first winding spindle.
a second drive gear coaxially connected with said second winding spindle,
drive means for driving said first winding spindle with a speed which is not substantially over that for winding up the tape during playback, comprising
a stationarily mounted motor,
a carrier arm pivotally mounted about a pivot axis,
a third drive gear,
a fourth drive gear,
said third and fourth drive gears being mounted on said carrier arm,
a belt means operatively connected to said motor and to said third and fourth drive gears for driving said third and said fourth drive gears in opposite working directions via said motor,
a first operating means upon actuation thereof for moving said carrier arm in a left operating position in which said third drive gear stands in operative connection with said first drive gear, thereby consequently driving the latter with said first winding spindle connected therewith for fast forward winding,
a second operating means for moving said carrier arm into a right operative position in which said fourth drive gear stands in operative connection with said second drive gear, thereby consequently driving the latter with said second winding spindle connected therewith for fast rewind,
a fifth drive gear arranged coaxially to said third drive gear,
a friction clutch operatively disposed between said fifth and said third drive gears,
a sixth drive gear being mounted coaxially to said first drive gear and displaceable in a direction of its axis,
a slider moveably disposed in a direction perpendicularly to the axes of said drive gears and including means for axially displacing said sixth drive gear such that upon movement of said slider in a first direction towards said drive gears, said sixth drive gear engages with said fifth drive gear, and
a third operating means for displacing of said slider.

4,133,499

FISHING REEL

William A. Purcell, Philadelphia, Pa., assignor to Penn Fishing Tackle Mfg. Co., Philadelphia, Pa.

Filed Dec. 16, 1977, Ser. No. 861,206
Int. Cl.[2] A01K *89/00*
U.S. Cl. 242—217 9 Claims



1. A fishing reel having spaced side housing members,
a spool interposed between said housing members,
a spool shaft journaled at one end in one of said housing members and to which said spool is secured,
said spool at its other end being journaled in said other housing member,
means for rotating said spool in one direction comprising
a hub mounted to said one of said housing members,
a stud shaft rotably carried by said hub,
a radial arm mounted to said stud shaft
a knob mounted to said radial arm for rotation thereof
a gear carried by said stud shaft
a spool gear movable along said spool shaft and driven by said stud shaft gear,
interengageable friction members one of which is on said spool and the other of which is movable with said spool gear, and
means for controlling operation of said spool,
said last mentioned means comprising
spring means for urging said interengageable members to out of engagement position for free spooling,
a brake control lever exteriorly disposed on said other housing member for manual manipulation, and
mounting members for said lever one of which is in cammed engagement with the other for applying a force in opposition to said spring means.

4,133,500

TOY KITES

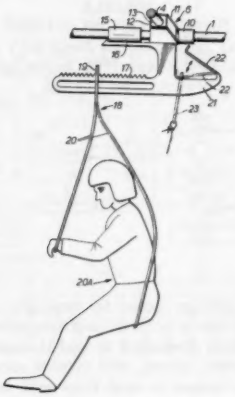
Thomas M. Chapman, Horton, England, assignor to The Mettoy Company Limited, Northampton, England

Filed Sep. 19, 1977, Ser. No. 834,512

Claims priority, application United Kingdom, Sep. 20, 1976, 38930/76

Int. Cl.[2] B64C *31/02, 31/06*

U.S. Cl. 244—153 R **9 Claims**



1. A toy kite having a frame, a sail attached to the frame and a tow line having a part fixedly secured to the tow line and attached to the kite, the improvement which comprises a kite having the general form of a hang glider and resilient means secured to the kite for releasing said tow line from the kite when in flight under the control of an operator, said tow line part being adapted to engage said resilient means to hold said resilient means in a stressed condition when said tow line is under tension, and said resilient means moving from said stressed position to disengage said part therefrom when said tow line is relaxed.

4,133,501

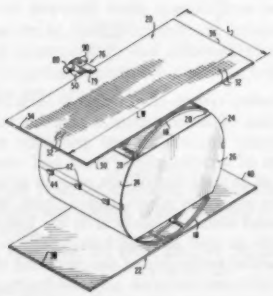
SELF-DEPLOYABLE SOLAR CELL PANEL

Chester J. Pentlicki, Gaithersburg, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Continuation of Ser. No. 620,007, Sep. 30, 1975, abandoned. This application Feb. 17, 1977, Ser. No. 769,805

Int. Cl.[2] B64G *1/10*

U.S. Cl. 244—173 **10 Claims**



1. In a spacecraft including a spacecraft body having a longitudinal axis and having at least one solar cell panel carried by said body and deployment means coupling said at least one panel to said body and operable to deploy said at least one panel radially outward of said body after spacecraft launch, the improvement wherein:

each said solar panel comprises a continuous, elastically deformable semi-rigid, normally flat substrate and has a width in excess of the diameter of the spacecraft body, and

said spacecraft includes releasable latching means for restraining said at least one solar panel substrate elastically, arcuately deformed and curved about the spacecraft longitudinal axis, in contact with the body exterior during vehicle spacecraft launch, said substrate returning to a substantially flat configuration solely due to the elastic property of said substrate upon release operation of said releasable means.

4,133,502

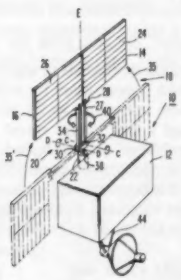
PLURAL PANELS DEPLOYED EFFECTIVELY AS A SINGLE PANEL

Andrew Anchutin, Titusville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 28, 1977, Ser. No. 782,036

Int. Cl.[2] B64G *1/10*

U.S. Cl. 244—173 **2 Claims**



1. In a spacecraft,

first and second plane solar arrays symmetrically stored on the spacecraft and lying in two planes during a stored position of said arrays,

first and second elongated link arms, each arm coupled at one end to said spacecraft and each arm coupled at the other end to one of said arrays, each said arm having a storage first position and a second position in which the two arms are adjacent to one another and side-by-side, the two arms lying in a common plane in both said first and second positions, said arrays, when in said stored position, being at an angle to said common plane, and each array being coupled to one of said link arms in such a way that each said array can be driven from said stored position to a position in said common plane,

means for rotating said arrays with respect to said link arms to move said arrays from said stored position to said position in said common plane, and

means for rotating said arms from said first position to said second position to thereby rotate both arrays to said position in which said arrays are in said common plane and in which an edge of one array is adjacent to a corresponding edge of the other array so that the two arrays can operate as a single array asymmetrically positioned on the spacecraft.

4,133,503

ENTRY, DISPLAY AND USE OF DATA EMPLOYED TO OVERCOME AIRCRAFT CONTROL PROBLEMS DUE TO WIND SHEAR

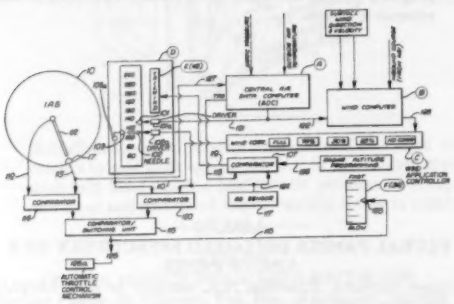
John H. Bliss, 2740 Graysby Ave., San Pedro, Calif. 90732

Continuation-in-part of Ser. No. 669,273, Mar. 22, 1976, which is a continuation-in-part of Ser. No. 608,408, Aug. 29, 1975, Pat. No. 4,021,010. This application Dec. 17, 1976, Ser. No. 751,801

The portion of the term of this patent subsequent to May 3, 1994, has been disclaimed.

Int. Cl.[2] G05D *1/12, 1/08*

U.S. Cl. 244—188 **33 Claims**



1. In the method of controlling the power to be applied to an aircraft engine during a final approach, whether wind shear conditions exist or not, and including the steps:

(a) monitoring deviation of actual airspeed from a target airspeed on the approach, and deviation of actual groundspeed from a target approach groundspeed on the approach, and

(b) employing such deviations in such a manner so that the approach speed is controlled by whichever of the actual speeds is lower compared to its associated target speed, and using said lower actual speed to control power to maintain a stabilized aircraft speed condition during the final approach, the improvement comprising:

(c) utilizing air temperature and pressure data to modify the value of target indicated airspeed thereby to derive a true airspeed value for use as a zero wind groundspeed marker value,

(d) displaying said value, and

(e) modifying said value as a function of an automatically or manually programmed surface wind velocity along course component to derive an uncompensated value of said target approach groundspeed, and

(f) in the case of a manually programmed surface wind velocity value, correcting said uncompensated value by selecting one of a group of possible percentages of wind component to derive a compensated target approach groundspeed.

4,133,504

SYSTEM FOR PROTECTED DATA TRANSMISSION TO TRACK-BOUND VEHICLES

Karl-Ulrich Dobler, Waiblingen, and Richard Spannagel, Stuttgart, both of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Sep. 2, 1977, Ser. No. 830,374

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1976, 2640756

Int. Cl.[2] B61L *27/00*

U.S. Cl. 246—5 **4 Claims**

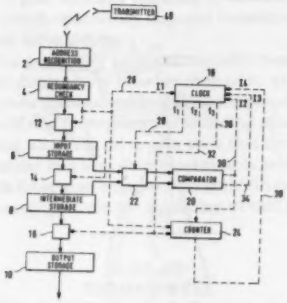
1. A system for reliable data transmission comprising:

(a) means for repeatedly transmitting data messages;

(b) means for receiving said messages;

(c) means connected to said receiving means for evaluating said messages for error, said last named means including comparison means for comparing one of said transmitted messages with at least one of said subsequently transmitted messages;

(d) storage means for storing said data messages, said storage means includes an input storage means for storing a message; intermediate storage means connected to said input storage means for storing a message received prior to receipt of the message stored in said input storage means;



and output storage means for storing a message determined to be free of error by said comparison means; and

(e) control means connected to said storage means and to said comparison means, said control means controlling said storage means to read from said storage means a message upon indication from said comparison means that said message is free of error.

4,133,505

RAILWAY SAFETY SYSTEM USING INTENSITY OF CURRENT

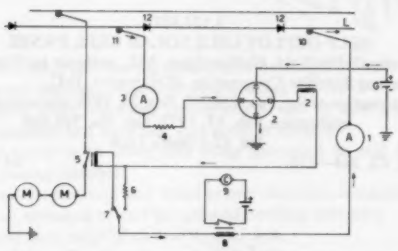
Domenico Bongiorno, Via Cavallotti, 53, Massa, Italy

Filed Mar. 24, 1977, Ser. No. 780,784

Claims priority, application Italy, Mar. 24, 1976, 18302 A/76; Feb. 7, 1977, 20006 A/77

Int. Cl.[2] B61L *3/10*

U.S. Cl. 246—167 D **11 Claims**



1. A railway safety system comprising on each train driving motors, a generator of direct current, a reverser pulse relay to reverse the polarity applied by said generator to two half circuits, the first of which, called "front half circuit", comprises the coils of at least one switch relay, a resistor and an ammeter and the second of which, called "back half circuit", comprises a second ammeter identical to the first and a compensating resistor; as well as fixed installations comprising a resistive line, parallel to the line of the track and along which current can travel in one direction only and having a predetermined resistance per length unit, along which two contacts per train will glide, called "pantographs", suited to close on a length of resistive line said two half circuits whereby, for each two adjacent trains on the same railway track, a circuit is formed comprising said front half circuit of the train which follows and said back half circuit of the train which goes ahead

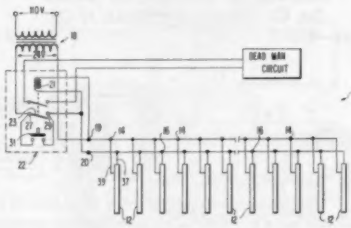
in the same direction or, in the case of two trains travelling towards one another, a circuit comprising the two front half circuits, said front half circuit further comprising a manual switch with two positions, the first of which leads to the connection of the coil of one of said switch relays in said half circuit and the second causes, in alternative, the connection of a resistor having the same resistance as said coil.

4,133,506

DERAIL SIGNAL SWITCH

Joseph Webster, 4309 Creek Rd., Conneaut, Ohio 44030

Filed Nov. 1, 1977, Ser. No. 847,438
Int. Cl.[2] B61L *3/04*
U.S. Cl. 246—172 **12 Claims**



1. In a system for sensing derailment of a remotely controlled train comprising a sensing means for sensing the derailment of said train and a circuit means integrated with said train for stopping the derailed train when sensed by said sensing means, wherein said sensing means comprises:

(a) a series of elongated deformable members;

(b) a rod member contained within each said elongated deformable member and electrically insulated therefrom;

(c) means for connecting said rod member and said deformable member to said circuit means for shutting down said train;

(d) said circuit means being activated upon said deformable member being pressed into contact with said rod member by said derailed train;

(e) said deformable members being of sufficient rigidity to withstand the pressure from a rubber tired vehicle such as a track cleaner, car or truck rolling thereover without being pressed into contact with said rod member;

(f) said elongated deformable members having sealing means at each end thereof for sealing the internal portions of said deformable members from moisture and other materials external thereto;

(g) said rod members being spaced from said deformable members by at least one electrical insulator supporting said rod members from said deformable members;

(h) said elongated deformable members being secured on cross ties between said rails.

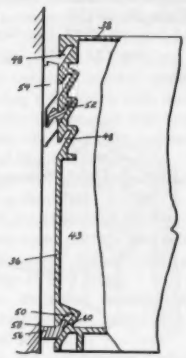
4,133,507

SYSTEM FOR MOUNTING STORAGE UNITS

Robert A. Chervenak, Seattle, Wash., assignor to Comerco, Inc., Takoma, Wash.

Filed Apr. 27, 1977, Ser. No. 791,317
Int. Cl.[2] A47B *67/02*
U.S. Cl. 248—225.2 **17 Claims**

1. A system for mounting storage units to a wall comprising a wall rail defining a U-shaped channel and adapted to be secured to a wall, and a mounting key comprised of two legs, a first of said legs fitting within said U-shaped channel and a second leg extending upwardly from said first leg end being adapted to slide upwardly within and being detachably secured in the rear portion of an upwardly extending slot located in the



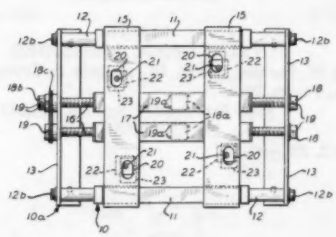
rear surface of a storage unit said slot extending longitudinally at said rear surface.

4,133,508

INVERTABLE MOUNT FOR MOTORS

Jerome J. Sloyan, Trenton, and Anton Kuppek, Pennington, both of N.J., assignors to Automatic Motor Base Co., Windsor, N.J.

Filed Dec. 23, 1976, Ser. No. 753,833
Int. Cl.[2] H02K *05/00*; F16M *11/04, 3/00*
U.S. Cl. 248—558 **4 Claims**



1. A motor mount comprising:

a slidable invertable carriage having opposing first and second motor-supporting surfaces;

said first and second motor-supporting surfaces having common portal openings formed therein and passing through the said surfaces for receiving motor-securing studs which are adapted to engage feet of a motor juxtaposed to and registering with said openings;

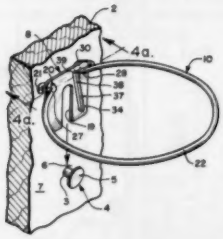
said portal openings when passing through said first surface being entirely positioned at least one on each side of an approximate centerline of said first motor-supporting surface, and said portal openings when passing through said second motor-supporting surface being positioned in mirror image relationship with respect to said placement of the portal openings passing through said first motor-supporting surface when said carriage is inverted, whereby the mounting of a motor is at one angular attitude when its feet are juxtaposed on said first motor-supporting surface and at a different angular attitude when its feet are juxtaposed on said second motor-supporting surface.

4,133,509

ARTICLE MOUNTING ASSEMBLY

William H. Kalbow, and Wayne R. Kalbow, both of 3318 Pearl St., Franklin Park, Ill. 60131

Filed Dec. 19, 1977, Ser. No. 861,646
Int. Cl.[2] A47K *1/08*
U.S. Cl. 248—313 **8 Claims**



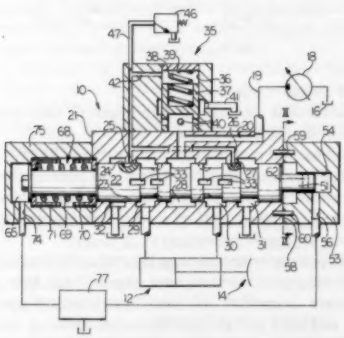
1. A mounting assembly for a container and the like parts holder, said assembly comprising a hoop portion adapted to embrace said holder and having a pair of free ends, a tab comprising a flat disk having means for mounting an associated anchor, means for pivotally connecting one of said ends of the hoop to said disk for pivotal movement relative thereto, cam means in said disk comprising a cam slot for engagement with the other end of the hoop, and means on said other end of the hoop cooperative with said cam means for locking and unlocking said hoop portion with respect to said holder attendant to predetermined pivotal movement of said disk, and said cam slot comprises a pair of angularly related portions having a juncture adjacent to the point of connection of said disk to said connecting means and thereat having a cam profile resisting movement of said other end of said hoop portion from a first portion of said cam slot to a second portion of the cam slot.

4,133,510

VALVE SPOOL POSITIONER

Larry W. Lorimor, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 9, 1977, Ser. No. 767,087
Int. Cl.[2] F15B *13/042*
U.S. Cl. 251—31 **6 Claims**



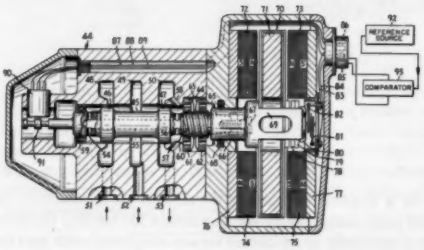
1. A pilot operated spool valve comprising:
an elongated housing defining an axial bore and a first radial port communicating with said axial bore;
a valve spool reciprocally mounted in said axial bore and resiliently biased to a first position;
a first end member affixed to said housing to close one end of the axial bore and defining a first pilot chamber;
a second end member affixed to said housing to close the other end of said axial bore and defining a second pilot chamber;
said spool defining an axial slot therein and having an axially extending noncircular tang;
the first pilot chamber in the first end member forming a tang cavity having substantially the same cross-sectional shape as the noncircular tang;
said spool reciprocally movable in said axial bore with said tang movable in said tang cavity, whereby rotation of said spool is prevented.

4,133,511

ELECTRO-HYDRAULIC REGULATING VALVE SYSTEM

Georg Hartmann, Marloffstein; Adam Dittner, Hockstadt, and Karl Prenzel, Nuremburg, all of Germany, assignors to Frieseke & Hoepfner GmbH, Erlangen-Bruck, Germany

Filed Jan. 26, 1977, Ser. No. 762,482
Int. Cl.[2] F15B *13/044*; F16K *31/02*
U.S. Cl. 251—133 **9 Claims**



1. In an electro-hydraulic regulating valve arrangement responsive to a reference value, comprising a valve casing, a movable valve member movable relative to the casing, hydraulic sleeve bearings, an electric motor having an armature and a stator, position sensing means, an electrical feedback arrangement, said armature having radially directed conductors, said stator being positioned axially of the radially directed conductors so that a major portion of the magnetic field of the stator links with the radially directed conductors, said armature and said movable valve member forming a structural unit supported by said hydraulic sleeve bearings and said sensing means being positioned to sense movement of a portion of said movable valve member, said electrical feedback arrangement being coupled to said sensing means and to said armature for comparing the output of said sensing means with the reference value and energizing the armature on the basis of the comparison.

4,133,512

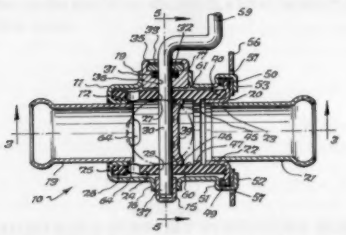
BUTTERFLY VALVE CONSTRUCTION

Jesse R. Johnson, Collins, N.Y., assignor to Coyle E. Knowles, Las Vegas, Nev. and Eugene L. Fisher, Gowanda, N.Y., part interest to each

Filed Mar. 8, 1977, Ser. No. 775,517
Int. Cl.[2] F16K *25/00*
U.S. Cl. 251—173 **6 Claims**

1. A valve construction comprising a housing, a substantially cylindrical flexible seating member having an inside portion and an outside portion within said housing, inlet and outlet portions on said seating member, first and second spaced apertures in said seating member, a shaft extending through said first and second spaced apertures, a disc mounted on the portion of said shaft between said first and second apertures for movement between a closed position wherein it is in engagement with said inside portion and an open position wherein it is spaced from said inside portion, a chamber between said outside portion and said housing, sealing means for effecting a sealing relationship between said outlet portion and said hous-

ing whereby said chamber is in fluid-tight relationship with said seating member at said outlet portion, opening means for effecting communication between the inside of said inlet portion of said seating member and said chamber, whereby pressurized fluid can enter said chamber, said chamber extending beyond said disc member toward said outlet portion to thereby provide an inwardly directed force on said outside of said tubular member in the area of said outlet portion to force the inside of said tubular member into seating engagement with said disc when said disc is in said closed position, said shaft extending beyond said first and second apertures in said seating member, first bearing means on said housing for supporting a



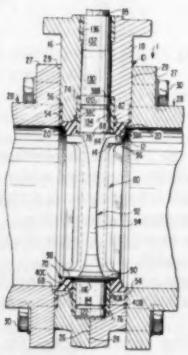
portion of said shaft proximate said first aperture, second bearing means on said housing for supporting a portion of said shaft proximate said second aperture, an inlet conduit comprising a conduit separate from said housing and in communication with said housing, and a fluid-tight joint between said housing and said inlet conduit, said inlet conduit having an inner end portion within said housing, said inlet portion of said seating member including an end portion located upstream of said inner end portion of said conduit, and said inner end portion of said inlet conduit extending downstream beyond said opening means and being spaced radially inwardly from said opening means so as to tend to direct the main stream of fluid flow beyond said opening means.

4,133,513

BUTTERFLY VALVE ASSEMBLY

Paul L. Meyer, Louisville, Ky., assignor to Celanese Corporation, New York, N.Y.

Filed Oct. 26, 1976, Ser. No. 735,299
Int. Cl.[2] F16K *1/226*
U.S. Cl. 251—306 **7 Claims**



1. A butterfly valve assembly of the type to be connected within a flow line, comprising:

a two-section housing, the sections of which being separatable in the axial direction of a flow passage through the housing;

a resilient liner seated within the housing and around the flow passage, said liner including:

diametrically opposed annular openings;

annular surfaces surrounding said openings; and

circumferentially disposed seating surfaces extending from one annular surface to the other;

a pair of cylindrical bushings bonded within said openings, each bushing having a flat inner end; and

a gate including closure, stem, and stub shaft portions;

said stem and stub shaft portions extending through respective ones of said bushings;

said closure portion including opposed wing elements and opposed bearing elements;

said bearing elements including annular bearing surfaces surrounding said stem portion and said stub shaft portion and bearing against said annular surfaces surrounding said openings in said liner;

said wing elements including sealing surfaces extending between said bearing surfaces operable to bear against said seating surfaces of said liner;

said sealing surfaces and said bearing surfaces being of continuous and uninterrupted spherical configuration;

said seating surfaces and said annular surfaces surrounding said openings being of continuous and uninterrupted spherical configuration whose center of curvature corresponds substantially to that of said spherical sealing and bearing surfaces; and

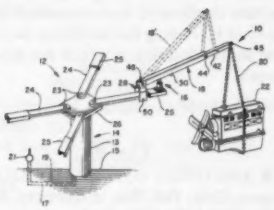
generally cylindrical shoulder portions extending outwardly from said spherical bearing surfaces and into said openings of said liner, said shoulder portions terminating in flat surface portions which encircle said stem and stub shaft portions and bear against said flat ends of said bushings.

4,133,514

ENGINE HOIST ATTACHMENT FOR AUTOMOBILES

Gerald B. Anderson, 8291 23rd St., Westminster, Calif. 92683

Filed Jan. 9, 1978, Ser. No. 867,862
Int. Cl.[2] B60P *1/48*
U.S. Cl. 254—124 **9 Claims**



1. A hoist for lifting automobile engines to and from automobiles and the like comprising:

a floor;

a main hoist permanently mounted in the floor;

said main hoist including a vertically reciprocable column with engaging means at its upper end for engaging under the frame of an automobile;

said engaging means comprising a plurality of arms mounted on said main hoist for pivotal movement about a vertical axis;

first power means for raising said main hoist to raise an automobile on said engaging means from the floor sufficiently to work under it;

a removable attachment selectively mountable on said engaging means for lifting a heavy object, said attachment being mounted on one of said arms;

said attachment moving with said main hoist but including lifting means moveable relative to said main hoist;

second power means for moving said lifting means relative to said main hoist;

said first power means being relatively insensitive to small movements but permitting a relatively large movement of

said main hoist and the lifting means therewith for gross movement of the object to be lifted; and

said second power means being relatively sensitive to small movements for precisely positioning the object to be lifted.

4,133,515

HEAT TREATMENT

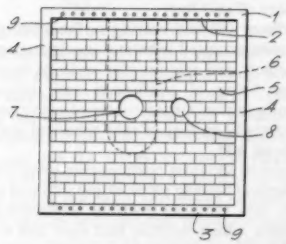
Brian C. Lilley, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Oct. 7, 1977, Ser. No. 840,215

Claims priority, application United Kingdom, Oct. 12, 1976, 42316/76

Int. Cl.² C21D *1/44*

U.S. Cl. 266—120 **11 Claims**



1. A heat treatment plant comprising an assembly of refractory material adapted to receive a bath in which metal articles may be heat treated and having a channel suitable for receiving a burner, a framework adjacent that part of the assembly of refractory material containing the channel, and at least one sub-frame mounted on said framework and adapted to receive the burner, the sub-frame being capable of traversing the framework, and the burner, when mounted on the sub-frame, being capable of traversing the sub-frame in a direction which is transverse to the direction in which the sub-frame traverses the framework.

4,133,516

SHOCK ABSORBER FOR WELL DRILLING PIPE

Rainer Jürgens, Celle, Fed. Rep. of Germany, assignor to Christensen, Inc., Salt Lake City, Utah

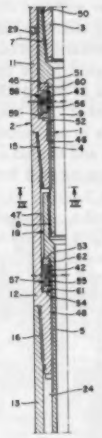
Filed Jul. 29, 1977, Ser. No. 820,211

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1976, 2647810

Int. Cl.² F16F *5/00*

U.S. Cl. 267—125 **34 Claims**

1. In a shock absorber for use in a well bore rotary drilling pipe string: an outer tubular body and an inner tubular body telescopically coengaged and defining a central flow passage, each body having an outer end connectible in the drill pipe string, torque transfer means between said bodies for rotating said bodies as a unit in said drill pipe string, means including said bodies defining therebetween an annular space filled with hydraulic fluid, spring means in said annular space for shock absorption and attenuation, said means defining said annular space including an upper seal between said bodies and a lower annular equalizer piston resciprocable between said bodies, said bodies defining an equalizer chamber below said equalizer piston communicating with one of the outside of said outer body and said central flow passage, said spring means comprising at least two parallel-acting spring columns in axially spaced relation, annular and axially spaced spring seats on the respective bodies defining a chamber for each spring column, means forming a flow path for said hydraulic fluid between said spring chambers, said spring columns including dish-type



spring washers stacked in sets whose stacking sense alternate axially of said columns.

4,133,517

CONTINUOUS REFLUX REFINING OF METALS

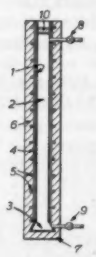
James D. Esdaile, Glen Waverley, and Graeme W. Walters, Mount Waverley, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Division of Ser. No. 616,816, Sep. 25, 1975, Pat. No. 4,043,802. This application Jun. 20, 1977, Ser. No. 808,387

Claims priority, application Australia, Sep. 30, 1974, 9067/74

Int. Cl.² C22B *9/00*

U.S. Cl. 266—200 **3 Claims**



1. Apparatus for the continuous purification of an impure metal containing metallic impurities which are soluble in the solid metal, and which is hypoeutectic with respect to the pure metal sought, said apparatus comprising:

a vessel to contain a vertical column of a slurry of crystalline metal in liquid metal;

heating means arranged so as to provide a relatively hot zone and a relatively cool zone at opposite ends of said column;

an intrusive cooling element means for partly or wholly immersing in the liquid metal in the cool zone and adapted to periodically chill at least a part of the liquid in the cool zone to form a coherent mass of crystals and then to allow incipient melting in the mass to release from the mass small crystals of relatively pure metal, thereby to form a slurry of the crystals in the liquid metal;

means for causing the cooling element to vibrate longitudi-

nally, in a direction parallel to the column and/or to have a rotating or circulatory motion about the lengthwise axis of the column, thereby to facilitate release of the crystals from the mass;

means for intermittently producing small relative motion of the crystals and the liquid in the column thereby to further separate and disperse the crystals released from the coherent mass and to facilitate transport by gravity of the crystals towards the hot zone;

means to withdraw purified liquid metal from the hot zone and means to withdraw metal of increased impurity content from the cool zone;

and means to supply the impure metal in liquid form to the column at the cool zone and/or at a level between the cool and hot zones.

4,133,518

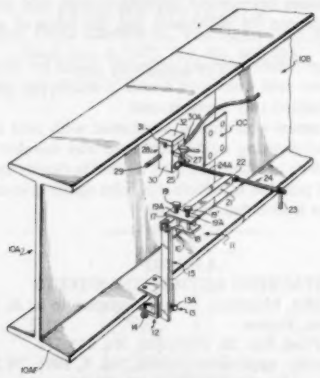
ADJUSTABLE SUPPORT STRUCTURE FOR RELEASABLY POSITIONING AN ARTICLE

Terry L. Clapper, 512 Cherry St., Martinsburg, Pa. 16662

Filed Apr. 28, 1977, Ser. No. 791,939

Int. Cl.[2] B23K *23/00*; B23Q *9/02*

U.S. Cl. 269—91 **28 Claims**



2. An adjustable support structure for positioning an article adjacent a surface comprising:

an attaching member adapted to be removably affixed to a supporting surface;

a first support member, adjustably mounted on said attaching member;

a second support member, adjustably mounted in a frame on said support member;

said frame including two plates spaced from each other by a plurality of pins forming at least four openings into which said second support member may be reciprocatably positioned in a plurality of positions relative to said first support member;

an adjusting rod, adjustably mounted transverse to said second support member;

said adjusting rod includes means for rotating the adjusting rod thereby imparting a reciprocating motion to an abutting plate mounted on one end of the adjusting rod; and

said abutting plate, said first support member and said second support member being adapted to releasably engage an article to hold an article adjacent to a surface.

4,133,519

VISE WITH SELECTABLE JAW FACES

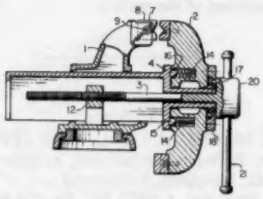
Kyoung-Ho Shin, No. San-1, Wondang-Ri, Wondang-Myun, Koyang-Kun, Kyungki-Do, Rep. of Korea, and Chong-Dai Hwang, Busan, Rep. of Korea, assignors to Kyoung-Ho Shin, Kyungki-Do, Rep. of Korea

Filed Sep. 20, 1977, Ser. No. 834,879

Claims priority, application Rep. of Korea, Jan. 24, 1977, 476[U]; Jan. 24, 1977, 477[U]

Int. Cl.[2] B25B *1/22*

U.S. Cl. 269—247 **5 Claims**



1. A vise comprising:

(a) a main body, said main body including a head portion having an L-shaped recess thereon, said recess being formed by two plate members integral with said main body, and a jaw member rotatably mounted in said L-shaped recess, said jaw member having a plurality of jaw faces thereon;

(b) a slide piston;

(c) an adjustable screw shaft coupling said slide piston to said main body; and

(d) an adjustable jaw means mounted on said slide piston, wherein said adjustable jaw means comprises a plurality of jaw plates rotatable about the axis of said adjustable screw shaft, each of said jaw plates having a jaw face corresponding to the jaw faces of said jaw member, whereby one of said jaw faces of said rotatably mounted jaw member is positioned opposite to a corresponding jaw face of said adjustable jaw means to form the jaws of said vise.

4,133,520

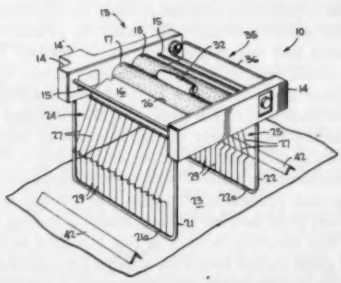
DECOLLATOR

David M. Roy, Union, N.H., assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.

Filed Sep. 19, 1977, Ser. No. 834,513

Int. Cl.[2] B65H *41/00*

U.S. Cl. 270—52.5 **10 Claims**



1. A machine for decollating an assembly of continuous forms into individual plies, comprising an upstanding frame having a terminal end capable of being supported on a surface which likewise supports the assembly of forms to be decollated, a pair of driven feed rolls mounted on an upper portion of said frame and being rotatable in opposite directions away from one another, one ply of said assembly being fed over each

of said driven rolls, guide means on said frame associated with both said rolls and sloping away therefrom toward said terminal end, a cylindrical forms separator roll, said rolls lying parallel and adjacent one another so as to define nips between said separator roll and said driven rolls, said separator roll bearing upon a portion of each said one ply which passes over said driven rolls and through said nips so as to be supported wholly by said driven rolls, said separator roll together with said driven rolls thereby effecting a positive separation of the forms into individual plies, and said driven rolls directing the individual plies over said guide means so as to be guided therealong onto portions of the surface.

4,133,521

SHEET MATERIAL COLLATING APPARATUS

Hans Müller, Zofingen, Switzerland, assignor to GRAPHA-Holding AG., Hergiswil, Switzerland

Filed Feb. 1, 1977, Ser. No. 764,640

Claims priority, application Switzerland, Feb. 19, 1976, 2023/76

Int. Cl.² B65H *5/30*

U.S. Cl. 270—55 **19 Claims**

1. In an apparatus for collating and otherwise manipulating sheet material articles including jackets which exhibit a tendency to open and inserts for such jackets, particularly in a newspaper stuffing apparatus, the combination of a plurality of pockets each having a first and a second wall, said second wall being movable with respect to said first wall between first and second positions and said walls enabling the jacket therein to open in one of said positions of said second wall; means for transporting said pockets along an endless path, said pockets extending transversely of the direction of movement of pockets along said path; at least one stuffer including a first device for feeding jackets between the walls of successive pockets in a first portion of said path and at least one second device for feeding inserts into the jackets in successive pockets in a second portion of said path; means for moving said second walls of successive pockets to said one position intermediate said first and second portions of said path; means for evacuating assembled jackets and inserts from successive pockets in a third portion of said path; at least one retaining device for each of said pockets; guide means for each of said retaining devices, said guide means having a longitudinally extending direction and extending transversely of the direction of movement of pockets along said path; means for introducing said retaining devices between the walls of successive pockets and into open jackets in such pockets intermediate said first and second portions of said path, said introducing means including means for moving said retaining devices in one direction along the respective guide means; means for moving the inserted retaining devices toward one of the respective walls to thereby clamp a portion of the open jacket against said one wall of the respective pocket during transport of pockets past said second feeding device; and means for removing said retaining devices from the respective pockets not later than in said third portion of said path, said removing means including means for moving said retaining devices in the opposite direction along the respective guide means.

4,133,522

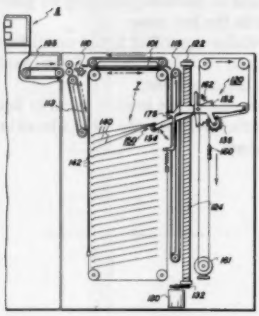
PIVOTING TRAY SORTING APPARATUS

William F. Siegl, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 9, 1973, Ser. No. 339,674

Int. Cl.² B65H *29/60, 31/24*

U.S. Cl. 271—173 **7 Claims**



1. Sorting apparatus comprising;

a frame;

an array of closely spaced tray members each pivotably supported by said frame;

conveyor means for conveying sheets past an inlet of each of said tray members;

carriage means operatively associated with said conveyor means adapted for movement past the inlets of said tray member;

said carriage means carrying deflector means for directing a sheet from said conveyor means towards the inlet of a predetermined tray member; and

actuating means operatively associated with said carriage means for pivoting a predetermined tray member from a first position in which the inlet thereof is closely spaced to a second position in which said inlet opening is extended as a sheet is directed thereinto.

4,133,523

STACKING DEVICE FOR SHEETS

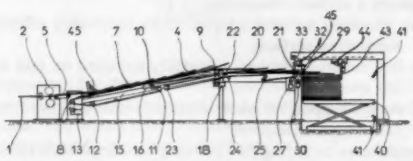
Daniel Berthelot, Montluel, France, assignor to S. A. Martin, Villeurbanne, France

Filed Jun. 29, 1977, Ser. No. 811,672

Claims priority, application France, Jul. 9, 1976, 76 21112

Int. Cl.² B65H *29/16, 29/66*

U.S. Cl. 271—182 **4 Claims**



1. A device for stacking sheets at the output of a machine for producing sheets, the device comprising:

a stack forming station in which a stack of sheets of a predetermined height is formed and discharged;

endless conveyor means for conveying sheets from the machine to said stack forming station;

means for detecting the height of a stack of sheets in said stack forming station;

means for causing relative vertical movement between the discharge end of said conveyor means and a stack of sheets in said stack forming station;

stop means at said discharge end of said conveyor means operable during discharge of a stack from said stack discharge station to prevent feed of sheets to said stack forming station;

said conveyor means including:

a first endless conveyor for receiving sheets from the machine and having a telescopic discharge end portion;

a second endless conveyor extending from said discharge end of said first conveyor to feed sheets to said stack forming station; and

means for moving said telescopic end portion of said first conveyor to move said discharge end of said first conveyor between two extreme positions above said second conveyor;

drive means for driving said first and second conveyors at a first linear speed which is less than, but in a constant ratio to, the speed of the machine during formation of a stack in said stack forming station, and for driving said second conveyor at a second reduced speed during discharge of a stack from said stack forming station; and

means for causing, at the beginning of a stack discharge operation, operation of said stop, reduction in the speed of said second conveyor, and for initiating retraction movement of said telescopic portion of said first conveyor at a speed such that the period of said retraction movement is at least equal to the period of a stack discharge operation, and, at the beginning of each stack formation operation, for initiating return movement of said telescopic portion of said first conveyor and increasing the linear speed of said second conveyor to said first speed.

4,133,524

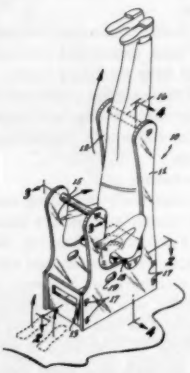
EXERCISE APPARATUS

Israel Barlew, 15212 Cantara St., Van Nuys, Calif. 91402

Filed Jun. 6, 1977, Ser. No. 803,618

Int. Cl.² A63B *23/02*

U.S. Cl. 272—111 **10 Claims**



1. An exercise device for accommodating a user in a shoulder stand position and a hanging from the knees position and assisting a user in assuming and maintaining these positions comprising:

a frame comprising two upright and generally parallel members spaced a distance apart which is greater in width than a user;

shoulder support means mounted between said upright members for supporting the shoulders of the user; and

a substantially horizontal pivot bar mounted between said upright members and forward of said shoulder support means at a height, generally corresponding to a user's midsection and at a distance forward of and above said shoulder support means by a distance generally conforming to the distance between the midsection and shoulders of a user whereby when a user faces and leans against said pivot bar and pivots about same, the user will assume an inverted position with the shoulders of the user resting on said shoulder support means.

4,133,525

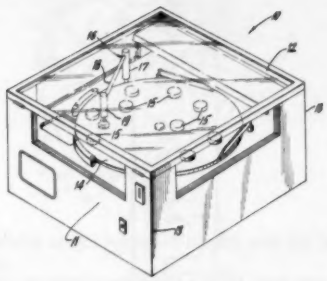
ELECTRICALLY OPERATED PLAYER CONTROLLED APPARATUS FOR PROVIDING A GAME OF SKILL

Richard Balles, 1280 Hobart Ave., Bronx, N.Y. 10461, and William F. Balles, Sr., 71-14 68th Pl., Glendale, N.Y. 11227

Filed Oct. 19, 1976, Ser. No. 733,856

Int. Cl.² A63F *9/00*

U.S. Cl. 273—1 E **3 Claims**



1. An electrically operated player controlled apparatus for providing a game of skill comprising:

(a) a plane member capable of rotational movement about its axis;

(b) an arm member rotatably maneuverable across a portion of surface of said plane member, capable of knocking from the surface of said plane member as it rotates about its axis an object placed thereon;

(c) means for causing said arm member to selectively rotatably maneuver across the surface of said plane member;

(d) a player actuated switch capable of initiating movement of said arm member;

(e) means for causing continuous rotational movement of said plane member about its axis beyond control of a player during a cycle of operation of said game; and

(f) means for selectively initiating said rotatably maneuverable arm member to move across a portion of the surface of said plane member as said plane member rotates, said movement once initiated by said player being beyond said player's control to stop during the cycle of operation of said game, said means comprising:

(i) a first coil capable of closing a first pair of contact points thereby providing a closed electrical path for current to flow to said player actuated switch, said first coil being actuated upon insertion of a coin into said electrically operated player controlled apparatus;

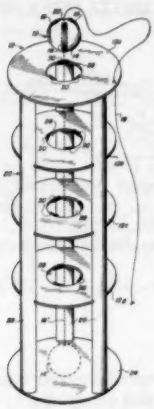
(ii) a second coil capable of closing a second pair of contact points thereby providing a closed electrical path for current to flow to said means for causing said arm member to rotatably maneuver across the surface of said plane member after said player actuated switch and said first coil have both been actuated;

(iii) means for causing said first coil and said second coil throughout the cycle of operation of said electronically operated player controlled apparatus to remain actuated, independent of the continued actuation of said player actuated switch, thus keeping closed said first and second pairs of contact points once said first and second coils have been actuated; and

(iv) means for deactuating said first and second coils thereby causing to open said first and second pairs of contact points, thus ending movement of said arm member across a portion of said plane member once a cycle of operation of said player controlled apparatus has

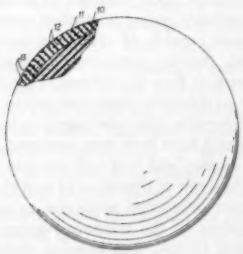
been completed, said deactuating being beyond the control of a player.

4,133,526
GAME OF SKILL
Arthur H. Anson, 3301 Congress St., Allentown, Pa. 18104
Filed Sep. 6, 1977, Ser. No. 830,419
Int. Cl.[2] A63B *67/10, 69/40*
U.S. Cl. 273—1 R **8 Claims**



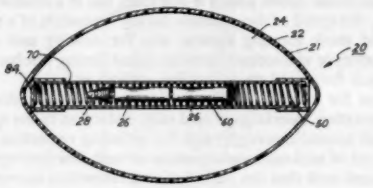
1. A game of skill in which a suspended object is gravity fed through a plurality of aligned and spaced apart rings, comprising:
(a) a circular object secured to a suspension line, an exterior surface on said object partially coated with a burr-like material,
(b) a plurality of aligned rings, in which each ring is provided with a circular opening larger than the circumference of said object, where each opening is partially lined with a burr-like material to which the burr-like material of said object adheres upon contact, and
(c) a frame maintaining said rings in an aligned and spaced relationship to one another.

4,133,527
BOWLING BALLS
Floyd L. Price, Costa Mesa, Calif., assignor to AMF Incorporated, White Plains, N.Y.
Filed Jan. 21, 1977, Ser. No. 761,100
Int. Cl.[2] A63B *37/14, 37/12*
U.S. Cl. 273—63 D **1 Claim**



1. In a hard rubber bowling ball, comprising a hard core and a surrounding hard rubber approximately ¼ inch thick outer cover, the improvement of minute cavities distributed solely throughout said cover, including its outer surface, to give increased traction between the ball and a bowling lane surface, wherein said cavities at said outer surface are empty, and said cavities in the rest of the cover being filled with particles of rubber which are softer in hardness than that of the cover.

4,133,528
ILLUMINATED GAME BALL
Jeffrey Koblick, Hopkins, Minn., assignor to K-tel International, Inc., Minnetonka, Minn.
Filed May 25, 1977, Ser. No. 800,208
Int. Cl.[2] A63B *43/06*
U.S. Cl. 273—65 EF **13 Claims**

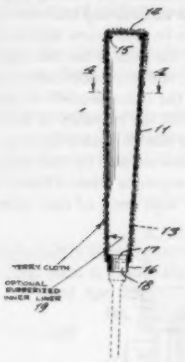


1. In a play ball having a hollow interior and walls which allow light to pass therethrough from said hollow interior, the improvement of apparatus for illuminating said play ball, said apparatus utilizing lamp means having two electrical lamp terminal means and battery means having two electrical battery terminal means, said apparatus comprising, in combination:
means connecting said battery means in series with said lamp means including,
(i) first electrically conducting compressible means for contacting one of said battery terminal means of said battery means;
(ii) second electrically conducting compressible means for securing said lamp means and simultaneously contacting one of said lamp terminals means, the other of said lamp terminal means being contacted with the other of said battery terminal means, said second compressible means also simultaneously contacting said first compressible means;
third compressible means; and
a translucent and electrically insulating casing for encapsulating said lamp means, said battery means and said first, second and third compressible means, said casing having opposed end pieces, said first, second and third compressible means being compressed between said opposed end pieces in serial order, whereby the lamp means and battery means are supported in said casing and whereby a series circuit for the flow of electricity is provided from said battery means, through said lamp means, through said second compressible means, through said first compressible means and hence to said battery means.

4,133,529
GOLF GRIP
Joseph Gambino, 85 Cobata Ave., Copiague, N.Y. 11726
Filed Aug. 1, 1977, Ser. No. 820,881
Int. Cl.[2] A63B *53/14*
U.S. Cl. 273—81 R **4 Claims**

1. A golf grip for fitting around a handle of a golf club, including in combination, an elongated sleeve having a closed upper end consisting of terry cloth material, said sleeve being shaped to suit a shape of a golf club and being sufficiently long

for both hands of a player to hold thereagainst, a plastic collar stitched within a lower end of said terry cloth material, and



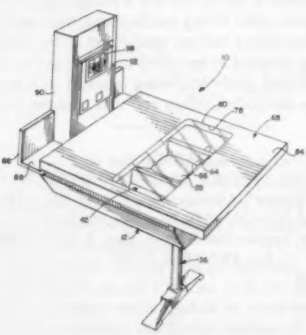
adhesvie material formed on the inner side of said collar for securing said sleeve onto said golf club handle.

4,133,530

GAME TABLE FOR BOOTH INSTALLATION

Peter L. Takaichi, San Jose, and Andrew W. Graybeal, Palo Alto, both of Calif., assignors to Atari, Inc., Sunnyvale, Calif.

Filed Sep. 23, 1977, Ser. No. 836,093
Int. Cl.² A63F *3/00*
U.S. Cl. 273—85 G **8 Claims**



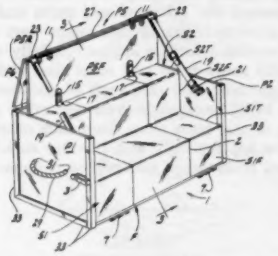
8. A table for combined use for playing a video game and for serving food or drinks and the like at a booth having spaced-apart seats, the table including the combination of an upwardly-open box-like frame, a video monitor carried within the frame, the monitor having a video screen which faces upwardly, a pair of control panels pivotally mounted on the frame and positioned on opposite sides thereof adjacent respective seats, game control means for controlling a video display on the monitor, said game control means including a manually-operated control element mounted on each control panel, said control means further including electrical circuit means having elements mounted within the frame, and a table top mounted on a side of the frame for pivotal movement between open and closed positions respectively away from and toward the frame, said table top including a transparent panel forming a continuation of the upper surface of the top, said transparent panel, when the top is moved to its closed position, being positioned in vertical register over the monitor as well as the control panel whereby individuals seated at opposite sides of the table can use their hands to manipulate the control elements under the table top while at the same time observing the monitor and/or the control elements through the transparent panel.

4,133,531

PORTABLE DEVICE FOR USE IN PLAYING STEP-BALL

Eldon F. Arteaga, 8442 Edna St., St. Louis, Mo. 63147, and James J. Lydon, Jr., 555 Main, Rm. 434, Beaumont, Tex. 77704

Filed Mar. 23, 1977, Ser. No. 780,515
Int. Cl.² A63B *63/04*
U.S. Cl. 273—102 R **9 Claims**



1. A portable device for use in playing step-ball or the like comprising:

a plurality of steps arranged in a flight, each step having a top face which a ball may strike, and a front face extending down from the top face at the front thereof to the top face of the step below;

flight and second panels forming side enclosures for the flight of steps;

a removable front panel for enclosing the front of the flight of steps;

a top panel for enclosing the top of the flight of steps, said top panel being movable from a closed position extending between the side panels over the flight of steps to an upright open position in which it forms a backstop at the back of the top step for a ball directed at the flight of steps; and

a back panel for enclosing the back of the flight of steps and means for hingedly attaching the top panel to the back panel for moving the top panel from its closed to its upright open position;

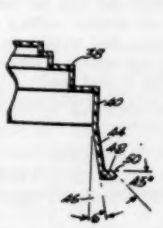
said top panel comprising a front section and a rear section and being hingedly attached to the back panel at its rear section.

4,133,532

SIMULATED TARGET PIGEON

Ludovico Lante-Montefeltro Della Rovere, Avenida Paez, Quinta Ismenia, El Paraiso, Caracas, Venezuela

Continuation-in-part of Ser. No. 604,069, Aug. 12, 1975, abandoned, and Ser. No. 679,135, Jun. 3, 1976, Pat. No. 4,077,384. This application Jan. 24, 1977, Ser. No. 762,019
Int. Cl.² F41J *9/16*
U.S. Cl. 273—105.4 **9 Claims**



1. A target pigeon, comprising

a generally cylindrical ring part centered on an axis;

two angularly spaced blades extending radially outwardly

from said ring part and each located in a respective plane lying at an acute angle to said axis and inclined propeller-fashion to the plane of the other blade;

a witness part lying generally in a plane perpendicular to said axis and having an outer periphery generally axially aligned with said ring part; and

two angularly spaced axially extending and radially deflectable legs formed on one of said parts and extending therefrom axially past the other of said parts, each of said legs having a radially extending foot formed with a surface facing toward the other of said parts and having one surface portion engaging said other part and another surface portion which is inclined radially outwardly of and axially away from said other part and includes an acute angle with said axis, each of said beveled surface portions being engageable with said other part on axial stressing of said parts away from each other to cam the respective leg inwardly and thereby detach said parts from each other when said pigeon is impacted while in flight.

4,133,533

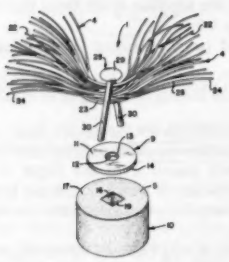
GAME DEVICE

Natividad F. Doyle, 6202 E. 150th St., Grandview, Mo. 64030

Filed Aug. 5, 1977, Ser. No. 822,046

Int. Cl.[2] A63B *67/18*

U.S. Cl. 273—106 A **4 Claims**



1. In a shuttlecock having a weighted base with one end thereof shaped for resilient impact with a shuttlecock projector; said shuttlecock being adapted to be propelled through the air and to assume a path of flight wherein the one end of said base is generally oriented forwardly most in the direction of said flight; the improvement comprising:

(a) an assemblage of lightweight, non-limp filament connected with the other end of said base and imparting a floating action to the flight of said shuttlecock;

(b) a weight having a marginal edge; and

(c) a sleeve being flexible and resilient, and having a central aperture extending therethrough; said weight being positioned laterally in said sleeve aperture and being axially movable between opposing ends thereof to vary the thickness of that portion of the sleeve disposed between said weight and said base one end; the marginal edge of said weight abutting an interior surface of said sleeve and frictionally retaining said weight in a selected position therein, whereby said weight is selectively, axially translated in said sleeve central aperture with respect to said base one end for adjusting shuttlecock tip cushion.

4,133,534

BALL GAME DEVICE

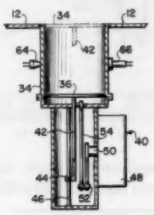
Kikuji Ikemoto, 100-27 Shinnarita, Hirono-cho, Uji, Kyoto, Japan

Filed Sep. 9, 1977, Ser. No. 831,800

Int. Cl.[2] A63B *69/36*

U.S. Cl. 273—176 E **5 Claims**

1. An improved ball game device having an undulatory game surface; a plurality of hole cups each provided with a bottom plate and embedded in said game surface at intervals; a bottom plate lifting mechanism associated with each of said hole cups and having a drive motor for raising and lowering the bottom plate of the associated hole cup between a predetermined position where a hole is formed below said game surface and a second position where no hole is formed and which is flush with said game surface; and sequence control means for controlling the actuation of the drive motors of said bottom plate lifting mechanisms so that the plurality of hole cups are successively selected one at a time in such a manner that only one hole is formed in said game surface by only one hole cup thus selected each time, said sequence control means including a holing detector associated with each of said hole cups for



detecting the ball holing at a hole cup now presenting a hole, said sequence control means having a circuit arranged so that on the basis of a holing detection signal produced by said holing detector, the bottom plate of the hole cup which the ball has entered is raised to destroy the hole and concurrently therewith the bottom plate of another hole cup is lowered to the predetermined position to form a hole, wherein the improvement comprises a lifting rod and a straight guide rod for each of said bottom plate lifting mechanisms, each said lifting rod having the associated bottom plate fixed to the upper end thereof and being adapted to be raised and lowered by a crank mechanism, each said guide rod being adapted to restrict the movement of the associated lifting rod to a straight line path.

4,133,535

PUTTING STROKE TRAINING DEVICE

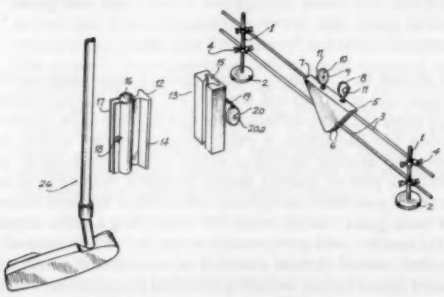
Robert Marsh, "Romar", Crossmolina, County Mayo, Ireland

Filed Nov. 30, 1976, Ser. No. 746,032

Claims priority, application Ireland, Dec. 1, 1975, 2604/75

Int. Cl.[2] A63B *69/36*

U.S. Cl. 273—192 **7 Claims**



1. A device for use in striking a golf ball with a putter, and in training a player to develop a correct stroke, which device comprises:

(a) a ground-engaging support member;

(b) a guide member supportable by the support member and having, when so supported a horizontally disposed rectilinear upper edge;

(c) a guided carriage adapted to rest in contact with said upper edge, and free to move to-and-fro along said guide

member when vertically lifted clear of said resting contact;

(d) means preventing movement of the guided carriage transversely of said upper edge, other than the vertical lift movement;

(e) means for rigidly attaching the shaft of a standard golf putter to the carriage with the putter head in ground contact; and

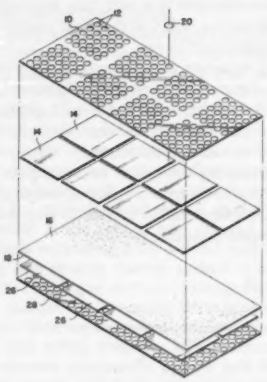
(f) means associated with said means for attaching the shaft to the carriage for selecting the angle of elevation of said shaft to the horizontal so that the putter sole is flat upon the ground.

4,133,536

BINGO CARD HOLDING AND MARKING DEVICE

Charles Cole, 7928 S. Sayre, Burbank, Ill. 60459

Filed Apr. 22, 1977, Ser. No. 789,822
Int. Cl.² A63F *3/06*
U.S. Cl. 273—240 **2 Claims**



1. A bingo card holding and marking device for retaining a plurality of bingo cards in position to permit marking thereof, each of the bingo cards having a face with a plurality of numbers thereon in rows and columns, said bingo card holding and marking device comprising

a backing plate having spaced opposite first and second substantially planar surfaces each accommodating a plurality of bingo cards thereon in rows and columns;

an adhesive coating on the first surface of the backing plate for releasably securing a plurality of bingo cards thereto with their faces up;

a transparent plastic sheet having a plurality of groups of circular holes formed therethrough in rows and columns corresponding to the bingo cards, each group having a plurality of circular holes in rows and columns corresponding to the numbers on the face of a bingo card; and

an adhesive coating on said transparent sheet for releasably securing said transparent sheet to the bingo cards secured to the first surface of said backing plate with the holes of said sheet in alignment with the numbers of said cards thereby permitting marking of the numbers of said bingo cards.

4,133,537

MULTI-LEVEL CHESS BOARD

Max G. Chappell, 485 Printy Ave., Milpitas, Calif. 95035

Filed Jul. 30, 1976, Ser. No. 710,208
Int. Cl.² A63F *3/02*
U.S. Cl. 273—241 **8 Claims**

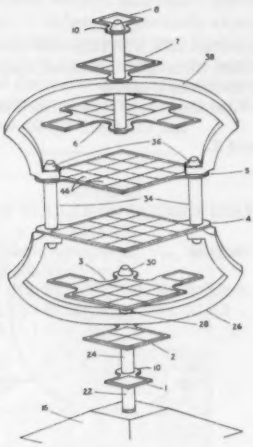
1. A multi-level chessboard comprising:

(a) a frame;

(b) eight vertically spaced horizontal stages mounted on said frame;

(c) each of said stages defining at least one playing square;

(d) the uppermost three of said stages together defining exactly sixteen playing squares and the lower most three



of said stages also together defining exactly sixteen playing squares whereby the black and white chess pieces may be arranged respectively on the upper and lower three stages, and the two remaining central stages define an initially open field.

4,133,538

PYRAMID BUILDING GAME

David W. Ambrose, 10 Nordica Dr., Croton on Hudson, N.Y. 10520

Filed Jul. 18, 1977, Ser. No. 816,445
Int. Cl.² A63F *3/00, 9/12*
U.S. Cl. 273—276 **7 Claims**

1. A game for a plurality of players, comprising a gameboard for each player, each gameboard including receptacle means for receiving one face of a polyhedron structure, a set of building blocks for each player, the blocks interfitting to form said polyhedron structure on the gameboard, said polyhedron structure being a regular pyramid having a square base, the base of said pyramid fitting into the gameboard and being retained in said receptacle means, each set of said building blocks comprising three groups of geometrically shaped blocks, which groups of blocks symmetrically interfit to form said regular pyramid, and wherein each block of said first group of blocks has a shape whereby when positioned in said receptable means a four faced regular pyramid extends upwardly from said gameboard for each block; each block of said

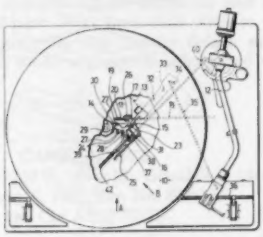
second group of blocks is in the shape of a symmetrical octahedron having a bifurcated lateral edge defining a pair of angularly oriented faces that extend to the vertex; and each block of said third group of blocks is in the shape of a four faced oblique pyramid having a parallelogram shaped base.

4,133,539

RECORD PLAYER SWITCH-OFF MECHANISM

Phillip H. Evans, Birmingham, England, assignor to BSR Limited, West Midlands, England

Filed Oct. 13, 1977, Ser. No. 841,753
Int. Cl.[2] G11B *15/00*
U.S. Cl. 274—1 L **4 Claims**



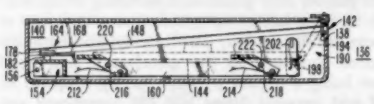
1. In a disc record player comprising a fixed deck plate, a rotatable turntable, a pick-up arm, a manually operable cue mechanism arranged to raise and lower the pick-up arm between an elevated condition and a "play" condition against a damping force, and a trip mechanism including a dog rotating with the turntable and a pivoted lever having a portion capable of co-operating with the dog to initiate a switch-off sequence of operations: the improvement comprising a trip lock mechanism arranged selectively to prevent operation of the trip mechanism and including a trip lock member having a portion co-operable, in a first position of the trip lock member, with the pivoted lever to restrain pivotal movement thereof into co-operation with said dog and, in a second position, to free said pivoted lever for such pivotal movement, the manually operated cue mechanism and trip lock member being operatively connected such that movement of the manually operated cue mechanism to lower the pick-up arm from an elevated to a "play" conditiion moves the trip lock member to said second position.

4,133,540

RECORD HANDLING SYSTEM FOR A VIDEO DISC PLAYER

Leslie A. Torrington, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed May 31, 1977, Ser. No. 801,604
Claims priority, application United Kingdom, Dec. 20, 1976, 53173/76
Int. Cl.[2] G11B *25/04*
U.S. Cl. 274—9 B **12 Claims**



1. A player apparatus for recovering prerecorded signals from a disc record comprising:

(A) a protective cover including a jacket having a record enclosing cavity and a record retaining member removably located within said jacket;

(B) a housing having an input slot dimensioned to permit an insertion of said cover into said player and its removal therefrom;

(C) means aligned with said input slot for guiding said cover insertion and removal;

(D) a turntable rotatably mounted in said housing for supporting a record during playback;

(E) means mounted in said player for engaging said record retaining member during cover arrival at a fully inserted position in said player;

said engaging means being subject to operation in a first condition and a second condition;

said engaging means, while disposed in said first condition, permitting cover arrival at said fully inserted position;

(F) means responsive to cover arrival at said fully inserted position in said player for alternating the condition of said engaging means between said first condition and said second condition;

said engaging means, while disposed in said second condition, causing a removal of said record retaining member from said jacket during a jacket withdrawal subsequent to an occupied cover arrival at said fully inserted position in a manner that such a jacket withdrawal results in retention of an enclosed record in said player;

(G) a platform mounted in said housing subject to motion between an elevated position and a depressed position;

said platform being disposed under said guide means for supporting a retained record when said platform is disposed in said elevated position; and

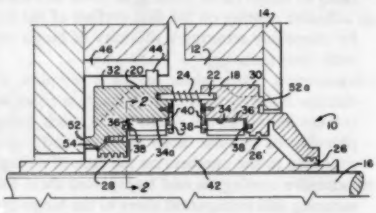
(H) means for causing motion of said platform to said depressed position to effect a transfer of said retained record to said turntable for rotation therewith with independence from said record retaining member.

4,133,541

SEAL

Robley G. Kirk, Easton, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Mar. 13, 1978, Ser. No. 885,854
Int. Cl.[2] F16J *15/34*
U.S. Cl. 277—65 **10 Claims**



1. For use in turbo-machinery having a housing, and a shaft journaled in said housing, said housing having a cavity formed therein in envelopment of said shaft, an improved oil seal for use in said cavity for sealing said shaft, comprising:

at least one seal body having a bore formed therein to receive said shaft axially therethrough;

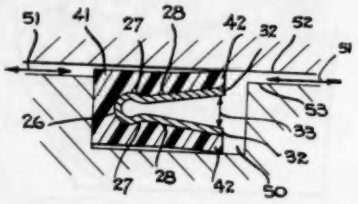
a plurality of bearing pads coupled to said body about said bore; and

means supporting said pads only at axial ends thereof to facilitate (a) a tilting of said pads relative to said bore, and (b) a positive, direct centering of said seal body relative to any such shaft axially received through said bore.

4,133,542
SPRING SEAL

Robert Janian, 12630 Miranda St., N. Hollywood, Calif. 91607, and Rolla J. Boyer, 11043 Newcomb Ave., Whittier, Calif. 90603

Filed Aug. 31, 1976, Ser. No. 719,086
Int. Cl.[2] F16J 9/06, 15/32
U.S. Cl. 277—152 1 Claim



1. A sealing device comprising:

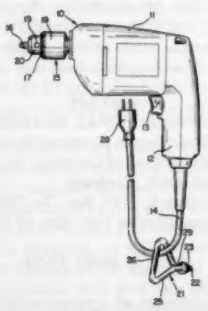
a unitary spring member including a base with a first diameter and having a convex surface extending fully around its exterior, and further including a pair of opposite arms together having a generally V-shaped cross section and rearwardly connected to said base through a narrow neck having a second diameter less than said first diameter and with forwardly divergent free ends normally separated a third distance greater than said first diameter; and

a casing in contact with a sealing surface and including a channel for receiving said spring, said channel having a heel formed at the rear of said channel by concave end wall means extending fully around said heel for snugly abutting said exterior convex surface of said spring base, and further having an entrance passage formed at the front of said channel by forwardly divergent side wall means for snugly abutting the outside surface of said spring arms leaving said spring arms free of any circumferential constraint directed rearwardly against said forward ends of said spring arms, and further having constricted junction means between said end wall means and said side wall means for engaging said neck to securely hold said base of said spring in cantilever fashion in said heel of said casing while enabling the forward end of said spring arms to flex freely exerting a lateral sealing force against said side walls of said casing.

4,133,543
CHUCK KEY

Henry B. Johnson, Fayetteville, N.C., assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed Aug. 31, 1977, Ser. No. 829,448
Int. Cl.[2] B25B 13/44
U.S. Cl. 279—1 K 6 Claims

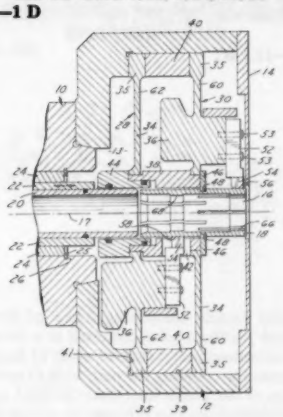


1. In a portable electric drill having a housing, an electric motor within said housing, output means comprising a chuck driven by said motor, an electric cord including a plug at one end for supplying power to said motor to rotate said chuck and a chuck key for tightening and loosening said chuck on a working implement, said chuck key comprising a handle and a gear; the improvement wherein said chuck key handle comprises a rod shaped to define a substantially closed loop, said electric cord extending through said loop the diameter of said cord being greater than any opening in said loop and at least one cross sectional dimension of said plug measured in a plane perpendicular to said cord being larger than any internal cross sectional dimension of said loop.

4,133,544
REPLACEABLE COLLET IN DOUBLE DIAPHRAGM CHUCK

James V. Halvorsen, Springfield, Vt., assignor to Bryant Grinder, Springfield, Vt.

Filed Oct. 25, 1977, Ser. No. 845,092
Int. Cl.[2] B23B 5/22, 5/34, 31/12
U.S. Cl. 279—1 D 1 Claim



1. A work holder adapted to minimize clamp distortion of a workpiece comprising:

(a) a spindle;

(b) a housing mounted on said spindle;

(c) a pair of front and rear diaphragms mounted in said housing;

(d) a plurality of jaws mounted on each of said front and rear diaphragms; and

(e) a metallic collet adapted to grip a workpiece mounted within said plurality of jaws; whereby the gripping forces on said front and rear jaw assemblies are adapted to be adjustably varied.

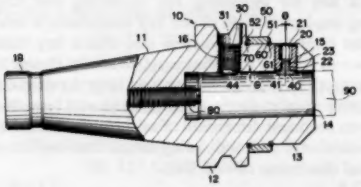
4,133,545
HOLDER FOR AN ELONGATE TOOL SHANK

Hideo Komori, Futtsu, Japan, assignor to Kuroda Seiko Co., Ltd., Kanagawa, Japan

Filed Jun. 29, 1977, Ser. No. 811,042
Claims priority, application Japan, Jul. 5, 1976, 51-88114[U]
Int. Cl.[2] B23B 31/04
U.S. Cl. 279—83 4 Claims

1. A tool holder comprising a body having a shank portion and a base portion with a cylindrical outer surface, a longitudinal bore in said body for receiving a tool shank, fastening means in said body intersecting said bore for tightening against the tool shank and a ring surrounding said outer surface portion, said ring and said base member, under stresses caused by

tightening said fastening means against the tool shank, being mutually deformable between a condition in which said ring is

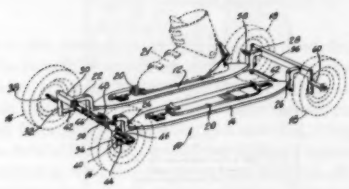


rotatable on said cylindrical surface and a condition in which said ring is non-rotatable on said cylindrical surface.

4,133,546
VEHICLE

Frank Rosenblum, 2370 Gold Ave., Apt. 202, St. Laurent, Quebec, Canada (H3A 1K4)

Filed Mar. 28, 1977, Ser. No. 782,091
Int. Cl.[2] A63C *17/02*
U.S. Cl. 280—11.1 BT **8 Claims**



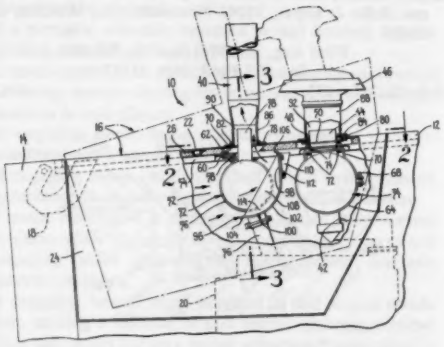
1. A wheeled vehicle comprising a pair of elongated platforms with each platform being mounted to a fore and aft axle for pivoting movement about each of a pair of parallel longitudinal axes, means for coupling the platforms to each other such that the planes of the platforms remain parallel to each other through said longitudinal axes throughout any pivoted position of the platforms; wheels mounted on said axles outboard of the platforms; fore and aft thereof, steering means engaged by said coupling means, a pair of said wheels mounted for pivoting movement about respective vertical axes to the ends of at least one of the axles, said steering means including means for controlling the pivoting movement of the wheels pivoted to said axle.

4,133,547
ENGINE COMPONENTRY

Anthony E. Fox, Ann Arbor, Mich., assignor to Massey-Ferguson Inc., Detroit, Mich.

Filed Jul. 11, 1977, Ser. No. 814,584
Int. Cl.[2] B60K *13/04*
U.S. Cl. 180—54 A **18 Claims**

1. Apparatus for a vehicle engine including a source of cooling air, an exhaust stack and a hood swingable relative to the engine to provide access for servicing the engine, a top, sides and louvers on said hood, said top and sides enclosing the engine to form a compartment for passage of an air path therethrough, said louvers permitting escape of air flow from beneath said hood, a muffler having an inlet and outlet, said muffler inlet connected to the engine, comprising: said exhaust stack mounted on said hood for movement therewith, said muffler outlet exhausting to said stack with said hood in the operative position, said stack overlapping said muffler outlet and having a diameter sufficient to create an annulus between said stack and muffler outlet where they overlap, a deflector located adjacent said muffler, an upstanding portion of said deflector directing at least a portion of the cooling air from its source past said muffler to said stack to vent the air and increase the draft of said stack by increasing the volume and velocity of air through the annulus between said stack and

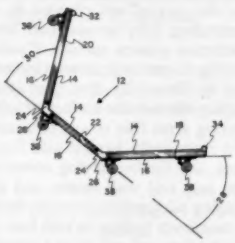


muffler outlet entraining the products discharged from said muffler outlet.

4,133,548
SCOOTER

Gerald E. Smith, 1528 Waterhouse St., East Ridge, Tenn. 37412

Filed Oct. 14, 1977, Ser. No. 842,117
Int. Cl.[2] B62K *9/00*
U.S. Cl. 280—87.04 R **5 Claims**



1. A scooter comprising:
(a) a riding platform comprising a plurality of planar surfaces connected with each other's ends at angles and forming interior and exterior platform surfaces;
(b) a holding means attached to at least one end of the platform for a person, who is supported by the platform and riding the scooter, to hold onto; and
(c) a plurality of roller means attached to the exterior near the ends of the planar surfaces for enabling the scooter to roll on a riding surface in a plurality of riding positions along the exterior surface,
whereby when the person riding the scooter shifts the weight of his body, the scooter shifts from one riding position to another while rolling on the riding surface.

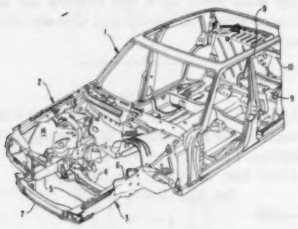
4,133,549
LONGITUDINAL BEARER

Willi Reidelbach, Sindelfingen; Hermann Renner, Magstadt, and Wolfgang Klie, Korntal, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed May 6, 1977, Ser. No. 794,387
Claims priority, application Fed. Rep. of Germany, May 12, 1976, 2620927
Int. Cl.[2] B62D *27/04*
U.S. Cl. 280—784 **13 Claims**

1. A longitudinal bearer of a motor vehicle frame which is constructed as a hollow profile and is provided with introduction places for introducing chassis forces into the frame and

into the longitudinal bearer, comprising a longitudinal bearer section having a buckling resistance which increases in a direction toward the vehicle center, said longitudinal bearer section being formed of at least two longitudinally extending bearer parts, said bearer parts being profiled sheet-metal members connected with each other along longitudinal seams so as to define a hollow cross-sectional profile, wherein one of said



bearer parts has a greater wall thickness than an opposing bearer part, and wherein the thicker bearer part defines a decreasing proportion of said cross-sectional profile in a longitudinal direction away from the vehicle center while said opposing bearer part defines a correspondingly increasing proportion of said cross-sectional profile in the direction away from the vehicle center.

4,133,550

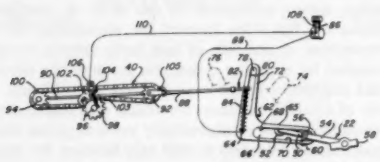
BICYCLE AND POWER TRANSMISSION SYSTEM

Lawrence G. Brown, 3285 Old Highway 395 North, Carson City, Nev. 89701

Continuation of Ser. No. 668,043, Mar. 18, 1976, abandoned. This application Feb. 3, 1978, Ser. No. 874,786

Int. Cl.[2] B60M *23/00*

U.S. Cl. 280—210 **140 Claims**



1. A bicycle or the like comprising:

front and rear wheel means for enabling movement of the bicycle;

frame means for supporting said wheel means and a bicycle rider;

drive shaft means operably associated with the rear wheel means for unidirectional rotary motion by application of output force thereto to rotate the rear wheel means to propel the bicycle;

foot operated pedal means mounted on said frame means for application of input forces by the bicycle rider;

rotatable crank arm means mounted on said frame means and connected to said foot operated pedal means for rotary movement about an axis of rotation by application of the input forces and providing a 360° power input cycle therebetween;

cam means mounted on said frame means for movement relative thereto and for operative association with each of said rotatable crank arm means for controlling the application of the input forces to said drive shaft means in accordance with predetermined force transfer characteristics;

oscillator means mounted on said frame means for movement relative thereto about an axis of oscillation and for operative association with said cam means for transfer of the input forces to said oscillator means for causing oscillating movement of said oscillator means in accordance with the predetermined force transfer characteristics provided by said cam means;

rear wheel drive means operably associated with said drive shaft means and said oscillator means for movement relative to said drive shaft means and for transfer of the input forces from said oscillator means to said rear wheel drive means and for applying output forces to said drive shaft means; and

speed change means associated with said oscillator means for selective change of the velocity of the movement of said rear wheel drive means within a predetermined range of selectable velocities.

4,133,551

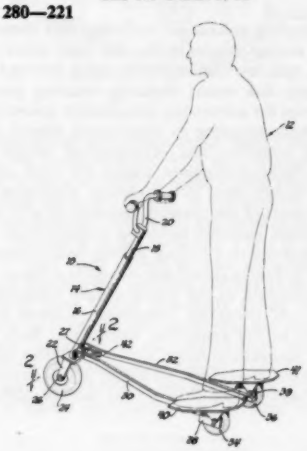
CAMBERING DEVICE FOR CAMBERING VEHICLE

Edward J. Biskup, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 727,593, Sep. 28, 1976, abandoned. This application Aug. 24, 1977, Ser. No. 827,267

Int. Cl.[2] B62K *5/00*

U.S. Cl. 280—221 **4 Claims**



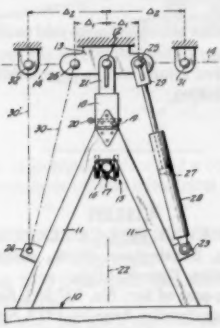
1. In combination with a cambering vehicle having an upright steering column supporting a pair of rearwardly extending trailing arms for pivotal movement about a first axis which extends transversely to the longitudinal axis of the vehicle, a mechanical cambering device for interconnecting the trailing arms so they move in substantially equal and opposite directions relative to the steering column when the vehicle is leaned into a turn, said cambering device comprising an elongated body portion, a bracket carried by said steering column for supporting said body portion for rotation about a second axis spaced rearwardly from said first axis and extending transversely to the longitudinal axis of said vehicle, said body portion terminating with a pair of opposed ends offset from said body portion and one of which being located adjacent one of said trailing arms and the other of which being located adjacent the other of said trailing arms, one of said opposed ends being offset an amount greater than the other of said opposed ends, and pin and slot connecting means joining each end of said body portion to an associated trailing arm so that pivotal movement of one of said trailing arms about said first axis in one direction results in said body portion being rotated about said second axis to cause the other of said trailing arms to be pivoted about the first axis in a direction opposite to said one direction.

4,133,552

CONTROL MEANS FOR A VEHICULAR TRACTOR-TRAILER CONNECTION

Gerald Sheine, Old Mill River Rd., Pound Ridge, N.Y. 10576

Filed Jun. 15, 1977, Ser. No. 806,861
Int. Cl.[2] B60D 1/00
U.S. Cl. 280—446 B 14 Claims



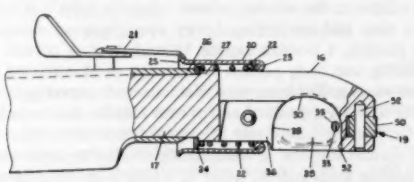
1. Trailer-coupling mechanism including first elements for application to towing-tongue or the like rigid structure of a towed vehicle, said first elements comprising first and second variably elongate link means including coacting piston and cylinder members for connecting transversely spaced parts of said towed-vehicle structure to transversely spaced parts of towing-vehicle structure, and pressure-fluid supply means including detachable-connection means for each of plural pressure-fluid supply lines independently connected to the respective end parts of the cylinder members of both said link means; and second elements including pressure-fluid control means for application to a towing vehicle, said pressure-fluid control means including detachable-connection means having detachable connection to the towed-vehicle detachable-connection means and providing independent control from the towing vehicle to the respective fluid-supply lines on the towed vehicle, said control means including a selectively operable pressure-fluid connection including a restrictive orifice and operative between two different end parts of said cylinder members.

4,133,553

SELF-CLOSING TRAILER COUPLER

William C. Pierce, Muskegon, Mich., assignor to The Hammerblow Corporation, Wausau, Wis.

Filed Jan. 10, 1977, Ser. No. 757,996
Int. Cl.[2] B60D 1/06
U.S. Cl. 280—509 8 Claims



1. In a coupler for a trailer wherein a ball is secured to one of either a vehicle or trailer and said coupler is secured to the other of said vehicle, said coupler has a body, a cap and a hinge pivotably mounting the cap to a front portion of said body, said cap and body being closeable along parting faces thereof; each of said body and cap having internal recesses forming a cavity for said ball when the body and cap are closed along parting faces thereof; and means for releasably latching said cap to said body in a closed position; the improvement which comprises:

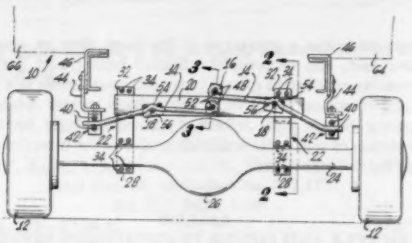
a protrusion rigidly connected to the cap at a side of the hinge opposite the interior recess of the cap; the body has an opening therethrough at a front portion thereof; the protrusion in registry with and projecting through the opening and into the cavity when the cap is open and away from the body; and the protrusion being so positioned that axial force by a ball toward the hinge forces the protrusion from the cavity and thereby closes the cap to the body.

4,133,554

ANTI-SWAY MECHANISM FOR MOTOR VEHICLES

Albert J. Lampert, San Clemente, Calif., assignor to Cambria Spring Company, Los Angeles, Calif.

Filed Apr. 27, 1977, Ser. No. 791,417
Int. Cl.[2] B60G 19/02
U.S. Cl. 280—689 13 Claims



1. For a vehicle having an axle housing and a body supported above the axle housing by a suspension system, an anti-sway mechanism that reduces tilting of the body relative to the axle housing and promotes uniform weight distribution on the wheels of said vehicle comprising:

reaction means connected to the body at predetermined points on the sides thereof for responding to vertical movement of one side of said body relative to said axle housing by applying a reaction force in the direction of said movement to the opposite side of said body;

a pair of fulcrum members on which said reaction means is pivotable within a substantially vertical plane; and

support means attached to said axle housing for supporting said fulcrum members.

4,133,555

HYDRAULIC SUSPENSION SYSTEM FOR VEHICLE WHEELS

Theodore C. Henter, Jr., 127 E. Montgomery Crrd., Savannah, Ga. 31406

Filed Aug. 9, 1977, Ser. No. 823,057
Int. Cl.[2] B60G 11/26
U.S. Cl. 280—709 9 Claims

1. An hydraulic suspension system for vehicle wheels comprising:

a. a horizontally extending bifurcated frame defining on each bifurcation an upright cylinder bracket and an inverted cylinder bracket, said bifurcation defining an intervening wheel well;

b. a pair of vertically extending piston rod housings extending between said upright cylinder bracket and said inverted cylinder bracket on each side of said wheel well;

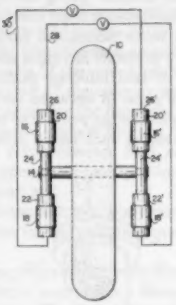
c. a wheel axle mounted upon a horizontal axis and extending between said pair of vertically extending piston rod housings;

d. a wheel mounted upon said axle and in vertical alignment with said frame bifurcations defining said wheel well;

e. an upright hydraulic cylinder mounted in said upright cylinder bracket and an inverted hydraulic cylinder

mounted in said inverted cylinder bracket on each bifurcation, each hydraulic cylinder having a head and a corresponding piston rod extending towards said axle;

f. an hydraulic transmission line extending intermediate the head of said upright cylinder on one side and the head of said inverted cylinder on the opposed side of said bifurcation and an hydraulic transmission line extending from the



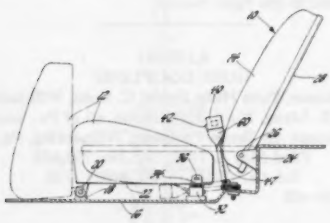
head of said inverted cylinder on one side to the head of said upright cylinder on the opposed side of said bifurcation such that vertical movement of said axle and said piston rids on one side invokes an hydraulic counterflow from the affected hydraulic cylinder to its connected counterpart on the opposed side, so as to maintain said wheel in alignment with said bifurcation.

4,133,556

SEAT BELT POSITIONING DEVICE

Paul A. Glinski, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 18, 1977, Ser. No. 816,334
Int. Cl.[2] B60R *21/10*
U.S. Cl. 280—744 **3 Claims**



2. In a motor vehicle body, the combination comprising:

a seat bottom having its forward end pivoted to the vehicle body for pivotal movement between a normal seating position and a forward pivotal position;

a seat back pivoted to the vehicle body for pivotal movement between a normal seating position and a generally horizontal cargo floor forming position;

a seat belt element including a strap having one end anchored on the vehicle body and a belt securing device attached to the other end;

a plastic stiffening boot enclosing the strap of the seat belt element to maintain the belt securing device at a set strap length from the one end anchored on the vehicle body;

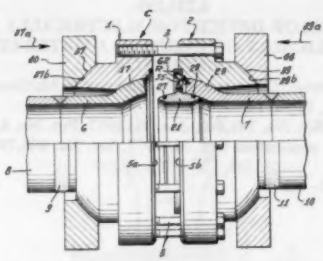
a spring of resilient wire having one end anchored on the vehicle body and the other end acting on the seat belt element and cooperating with the plastic boot to position the belt securing device in an occupant accessible position extending between the seat back and seat bottom and resiliently holding the seat belt element in engagement with the seat back and yielding under engagement of the seat belt element of the seat back when the seat back is tilted forwardly to the cargo floor position and maintaining the seat belt element in engagement with the seat back to return the seat belt element to the normal occupant accessible position when the seat back is returned to its normal seating position.

4,133,557

PRELOADED MISALIGNMENT PIPE CONNECTOR

Arthur G. Ahlstone, Ventura, Calif., assignor to Vetco, Inc., Ventura, Calif.

Filed Aug. 12, 1977, Ser. No. 824,072
Int. Cl.[2] F16L *27/06*
U.S. Cl. 285—39 **19 Claims**



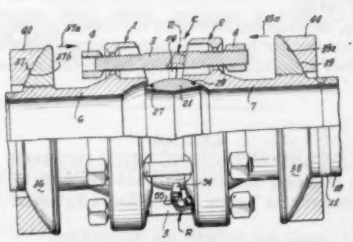
1. A misalignment connector comprising: a pair of metal hub parts having flared ends provided with internal and external spherical surfaces; an internal metal sealing ring having external spherical surfaces engaged by the internal spherical surfaces of said hubs and axially and circumferentially pre-loaded thereby; restraining means including a pair of complemental connector body parts having internal spherical surfaces engaged with said external spherical surfaces on said hubs; one of said pair of parts having oppositely facing thrust surfaces engageable by a loading tool for pre-loading said sealing ring; and means applicable to said pair of body parts while said sealing ring is pre-loaded by said loading tool for interconnecting said pair of body parts and holding all of said spherical surfaces in loaded engagement upon removal of said loading tool.

4,133,558

MISALIGNMENT PIPE CONNECTOR

Arthur G. Ahlstone, Ventura, Calif., assignor to Vetco, Inc., Ventura, Calif.

Filed Aug. 12, 1977, Ser. No. 823,918
Int. Cl.[2] F16L *27/06*
U.S. Cl. 285—39 **18 Claims**



1. A misalignment connector comprising: a pair of metal connector hubs defining a fluid passage and having opposed spherical surfaces circumscribing said passage; a metal seal ring having an external spherical surface engaged between said spherical surfaces of said hubs and axially and circumferen-

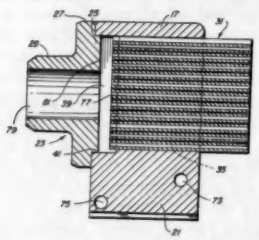
tially preloaded thereby; means engageable by a preloading tool for initially loading said spherical hub and ring surfaces togther; and restraining means applicable to said hubs while said sealing ring is preloaded by said loading tool for holding said hubs together with said spherical surfaces of said hubs and said sealing ring in metal-to-metal sealing engagement and with said sealing ring axially and circumferentially inwardly loaded upon removal of said loading tool; said restraining means having additional spherical surfaces coengaged to prevent relaxation of said seal ring over a range of angular misalignment of said hubs including members projecting outwardly from said hubs and holding means preventing separation of said members, said additional spherical surfaces being on said members and said holding means.

4,133,559

CONNECTOR DEVICE FOR ELECTRICALLY AND HYDRAULICALLY CONNECTING A WATER-COOLED CONDUCTOR

David P. Davies, Columbus, Ohio, assignor to McGraw-Edison Company, Elgin, Ill.

Division of Ser. No. 761,446, Jan. 21, 1977, Pat. No. 4,066,203.
This application Oct. 31, 1977, Ser. No. 846,790
Int. Cl.[2] F16L *53/00*
U.S. Cl. 285—41 **6 Claims**



1. A connecting device employed in forming an electrical and hydraulic connection for receiving a conductor bar assembly of predetermined size, said device comprising:

a pair of clip members having a generally rectangular body section and mating surfaces;

a conductor bar receiving chamber portion extending inwardly from one end of each of said clip members;

a larger water cavity portion extending inwardly from the other end of each of said clip members; and

a water inlet member to introduce water into said cavity, said water inlet member having a stem to extend partially into said water cavity with a tight fit, a flange of generally the same cross-sectional size and shape as said clip members when said clip members are joined together, and an elongated neck with a central passage that continues through said flange and said stem to convey water to said water cavity;

whereby, the chamber formed by the conductor bar receiving chamber portion of said pair of joined together clip members is slightly smaller than said predetermined size of said conductor bar assembly.

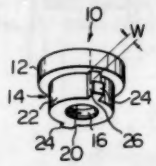
4,133,560

PLUG AND ATTACHING HOLE THEREOF

Masakazu Ishikawa, and Tsutomu Chuwman, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Jun. 9, 1977, Ser. No. 804,926
Claims priority, application Japan, Jun. 28, 1976, 51-83955[U]
Int. Cl.[2] B65D *51/16*; F16L *5/02, 41/08*
U.S. Cl. 285—81 **6 Claims**

1. A plug and an attaching hole therefor, in which said plug is interposed between a pressure container and an accessory when removably attaching said accessory to said pressure container, said attaching hole is of a circular shape and provided in the wall of said pressure container, and provided with cut-away portions in the peripheral edge portion of said hole; and said plug includes a head portion and a shank portion continuous with the undersurface of said head portion, with a through-hole running through said head portion and said shank portion, said through-hole receiving a coupling portion of said accessory, said shank portion being formed with build-up portions spaced a given distance from the undersurface of said head portion, on the outer peripheral surface of said shank portion, said cut-away portions having a shape and size complementary to those of said build-up portions, and press fit means for providing a press fit between surfaces of the shank portion and said peripheral edge portion of said hole in a radial direction and for increasing such radial press fit upon turning



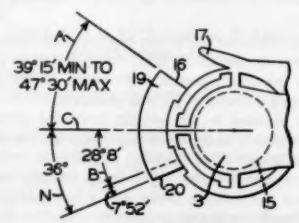
of the shank portion relative to the hole, the press fit means including surfaces of the peripheral edge portion of the hole which decrease in radius in the direction of turning of the shank portion, said plug including a pair of stepped ridge portions each consisting of the build-up portions and a recessed portion having a radius larger than that of the shank portion but smaller than the head portion, the recessed portion providing the press fit with the peripheral edge portion of the hole, the recessed portion being between the build-up portions and the head portion, whereby upon attachment of said plug to said pressure container, said shank portion of said plug is inserted into said circular plug-attaching hole, with said build-up portions being mated with said cut-away portions, and then turned, after which the outer periphery of said head portion may be secured to the edge portion of said circular plug-attached hole in gas tight manner.

4,133,561

HOSE COUPLING

John G. Cannon, Penn Hills; Daniel G. Scott, Wilkinsburg, and William K. Mong, North Huntingdon, all of Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed May 4, 1977, Ser. No. 793,665
Int. Cl.[2] F16L *35/00*; B60D *1/08*
U.S. Cl. 285—68 **1 Claim**



1. An improved brake hose coupling for use with a railway vehicle brake hose to be coupled with a counterpart hose coupling of a counterpart brake hose of an adjacent vehicle, each of said hose couplings comprising:

(a) a hollow body portion having an opening therein for registering with a complementary opening in the counterpart hose coupling;

(b) a nipple portion joined to said body portion in axially

aligned relationship thereto and communicable with said opening through the hollow body portion;

(c) said body portion having an arcuate groove formed thereon between said opening and said nipple portion, peripherally adjacent and in concentric relation to said opening, and transversely to the axis of the coupling, said axis dividing said groove into an upper portion and a lower portion disposed on opposite sides thereof;

(d) an arcuate lip portion formed on said body portion peripherally adjacent and in concentric relation to said opening, diametrally opposite said arcuate groove, and transversely to the axis of the coupling for rotatably engaging the arcuate groove of the counterpart hose coupling, and vice versa, for retaining the two hose couplings in coupled relationship upon a certain amount of relative rotation in one direction therebetween, said axis dividing said lip portion into upper and lower portions disposed on opposite sides thereof; and

(e) stop means formed on said body portion for limiting said relative rotation to said certain amount in said one direction,

(f) said hose couplings being operable, upon said certain amount of relative rotation in a direction opposite to said one direction to an uncoupled disposition in which said lip portions rotatably disengage said grooves, respectively,

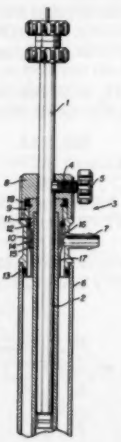
(g) the angular dimension of the upper portion of said lip portion being up to a maximum of 47° 30', and the angular dimension of the lower portion of said lip portion being at least 36°.

4,133,562

SEPARATION COLUMN

Lars-Göran H. Andrén, Upsala, Sweden, assignor to Pharmacia Fine Chemicals AB, Upsala, Sweden

Filed Apr. 5, 1977, Ser. No. 784,823
Int. Cl.² F16L *55/00*
U.S. Cl. 285—187 **6 Claims**



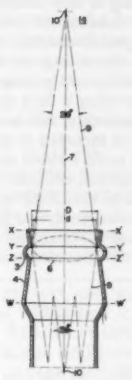
1. A separation column comprising a column tube and terminal flanges, said terminal flanges being sealed relative to the column tube by means of a two-layer material which encloses a portion of the column tube and a portion of one of said terminal flanges, said two-layer material comprising an inner fusible plastic tubular layer in contact with the column tube and said terminal flange and a concentric outer tubular layer of shrinking plastic, having been subjected to a heat treatment causing the fusible plastic layer to fuse and adhere to said terminal flange and column tube, and the shrinking plastic hose to shrink and exert a radially directed force against said fusible layer.

4,133,563

PIPE JOINT

Sadayoshi Yamazaki, 2-12-5, Takaodai, Suma Ward, Kobe City, Hyogo, Japan

Filed Feb. 7, 1977, Ser. No. 766,345
Claims priority, application Japan, Feb. 12, 1976, 51/14174
Int. Cl.² F16L *21/00*
U.S. Cl. 285—231 **2 Claims**



1. a pipe joint having a one-piece socket assembly provided with an annular groove for receiving a rubber ring seal, the internal surface of said socket comprising tow conic parts which axially diverge from the circumferential edges of said groove to the opposite directions along two conic surfaces with identical vertical angles, respectively, such that said two conic parts formed along said two conic surfaces, respectively, pass through a circle having a larger diameter than a pipe to be inserted and imaginarily provided on a section taken along the outside circumferential edge of said groove with its center on the axis of said socket and which have vertexes with identical vertical angles on the axis of the socket at the opposite sides of said section and diverge from the circumferential edges of said groove inwardly and outwardly, respectively, wherein said vertical angle is $2\theta°$ and has the following relationship when the inclination of said pipe to be inserted is assumed to be $\theta°$:

$$D = d/\cos\theta°$$

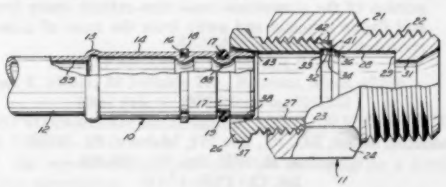
wherein D is the inside diameter of the socket at the section taken along the outside circumferential edge of the groove and d is the outside diameter of the pipe to be inserted and wherein $\theta°$ is greater than 4°.

4,133,564

QUICK CONNECT TUBE COUPLING

Charles R. Sarson, Euclid, Ohio, and Frederick S. Browne, Farmington Hills, Mich., assignors to Dana Corporation, Toledo, Ohio

Filed Dec. 27, 1976, Ser. No. 754,567
Int. Cl.² F16L *37/08*
U.S. Cl. 285—321 **7 Claims**



1. A quick connect coupling providing a body assembly having a tube end rceiving passage with a seal portion and a

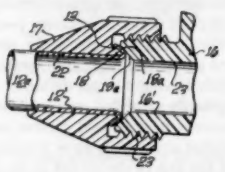
radially extending wall for positioning a lock ring, and a tube formed with an integral end portion having a substantially uniform wall thickness substantially equal to the wall thickness of the remainder of said tube, said end portion providing a substantially cylindrical wall having an inside diameter greater than the diameter of said remainder of said tube and a peripheral groove, the wall of said end portion at said groove extending inwardly and around said groove to maintain said substantially uniform thickness, the inside diameter of said end portion around said groove being at least substantially as large as the inside diameter of said remainder of said tube, a snap lock ring bridging between said groove and said radially extending wall operating to lock said end portion in said passage when said end portion is assembled in said passage, seal means separate from said lock ring providing a fluid tight joint between said end portion and body assembly, said body assembly including a body member and a nut threaded to said body member, said radially extending wall being formed on said nut substantially adjacent the inner end thereof, said nut having a counterbore at its inner end, said radially extending wall being provided by the inner end of said counterbore, and said nut being threaded to said body member until the inner end of said nut bottoms on said body member.

4,133,565

FITTING EMPLOYING FLEXIBLE PLASTIC TUBING WITH ROLLED BACK END

George V. Shutt, 918 Willow Springs La., Glendora, Calif. 91740

Filed Jul. 25, 1977, Ser. No. 818,524
Int. Cl.[2] F16L *25/00*
U.S. Cl. 285—334.5 6 Claims



1. In a beaded plastic tubing joint, the combination comprising:

a) relatively flexible polybutylene tubing having a rolled end portion forming a reversely turned bead, and

b) relatively rigid annular structure at opposite sides of the bead and pressurizing the bead annularly and through the wall thickness thereof to form an annular seal, and to retain the bead in position,

c) said structure including interconnected coaxial pin and box members having opposed shoulders at opposite sides of the bead, said shoulders effecting said pressurizing, the box member having an annular flange over which said bead is rolled, said flange forming one of said shoulders, said flange tapering toward an annular terminal which is convexly rounded in axial radial planes, said bead rolled over said terminal and extending frusto-conically to engage said one shoulder, said pin and box member opposed shoulders being differentially tapered to form a bulge in a portion of the pressurized bead that extends away from said flange terminal and away from the zone of closest approach of said shoulders.

4,133,566

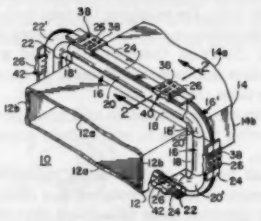
HIGH PRESSURE DUCT CLAMP AND METHOD OF USE

Robert B. Miller, RD. #1, Box 191, Malvern, Pa. 19355

Filed Jun. 23, 1977, Ser. No. 809,489
Int. Cl.[2] F16L *17/00*
U.S. Cl. 285—350 10 Claims

1. An improved duct joint for permanently and sealably connecting two duct sections, said duct sections having peripheral flanges forming opposite and corresponding halves of a composite, T-shaped, peripheral flange extending outwardly from said duct sections, said composite flange having an upper cross-piece portion and a lower upright portion, said lower upright portion containing a continuous reservoir of deformable gasket material, the improvement comprising:

a plurality of clamps crimped to said upper portion of said T-shaped flange at spaced intervals thereon, the inner surface of the each of said clamps being pressed against upper and lower surfaces of said upper cross-piece portion co-extensive with said clamps, said upper portions being



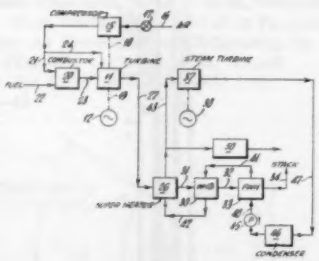
thereby pressed together with sufficient pressure to force a portion of said gasket material to flow out from said reservoir between said flange halves toward said duct sections and produce a sealed joint therebetween; and, each of said plurality of clamps and corresponding co-extensive sections of said upper cross-piece portion having a series of ripples therethrough, said series of ripples preventing said plurality of clamps from slipping out of clamping contact with said upper portion of said T-shaped flange, thereby permanently connecting said duct sections.

4,133,567

COMBINED CYCLE ELECTRIC POWER GENERATING SYSTEM WITH IMPROVEMENT

Rodney McGann, Santa Cruz, Calif., assignor to Texaco Inc., New York, N.Y.

Filed May 11, 1977, Ser. No. 795,694
Int. Cl.[2] G05B *15/00*
U.S. Cl. 290—40 R 8 Claims



1. In combination with a combined cycle electric power generating system including a constant speed gas turbine for driving a first electric power generator, a combustor for supplying high temperature gas to drive said gas turbine, a compressor driven by said gas turbine for compressing air to be delivered to said combustor, means for delivering fuel to said combustor with said compressed air, a steam turbine for driving a second electric power generator, a boiler for supplying steam to drive said steam turbine, and means for connecting the outlet from said gas turbine to said boiler for supplying heat thereto, the improvement comprising

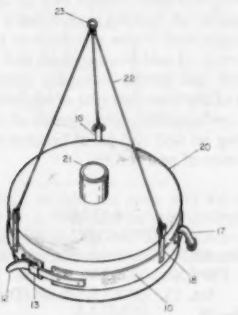
means for throttling the inlet of said compressor for main-

taining efficient operation at low load on said electric power generators.

4,133,568
LIFT DEVICE

David W. Williams, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 28, 1977, Ser. No. 791,807
Int. Cl.² B66C *1/18*
U.S. Cl. 294—74 **3 Claims**

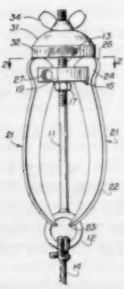


1. A lift device for attachment to a roll of frangible material, said device comprising an elongate flexible band having two ends, a band fastening means attached to one end of said band and a secondary member attached to the other end of said band, said secondary member designed for coacting with and being grasped by said fastening means, a single lift strap attached to said band adjacent to one end thereof, a first pair of spaced apart lift straps positioned adjacent to and attached near the other end of said band, and a second pair of spaced apart lift straps attached to said band and positioned intermediate said single lift strap and said first pair of straps, the spacing between said single lift strap and said second pair of straps and the spacing between said second pair of straps and said first pair of straps exceeding the space between the individual members of said first and second pair of straps.

4,133,569
GRAPPLING DEVICE WITH COLLAPSIBLE GRIPPING ARMS

Donald R. Pavack, 1905 Shenandoah Ave., Milpitas, Calif. 95035, and Lawrence D. Sabo, 1777 Trudean, San Jose, Calif. 95132

Filed Oct. 25, 1977, Ser. No. 844,796
Int. Cl.² B66C *1/10*
U.S. Cl. 294—106 **7 Claims**

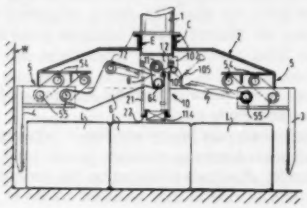


1. A grappling device comprising a stem, first means at a first end of said stem for attachment of a line, the second end of said stem for attachment of a line, the second end of said stem opposite said first end being threaded, a spreader on said stem adjacent but spaced inwardly of said second end, said spreader being formed with a plurality of radial slots, a plurality of curved grappling arms, each said arm having a distal point and a proximal end formed with a first cam surface, second means pivotally mounting each said arm in one of said slots for swinging movement between a storage position with said points positioned inward vicinal said stem and a use position with said points remote from said stem, and a hollow nut threaded on said second end of said stem, said nut having a second cam surface shaped so that when said nut is turned toward said spreader said first and second cam surfaces engage to secure said arms in use position.

4,133,570
HOISTING APPARATUS HAVING IMPROVED CLAMPING MEANS

Willem C. Hammink, Woerden, and Cornelis A. M. Verheul, Werkhoven, both of Netherlands, assignors to B. V. Nederlandse Kraanbouw Maatschappij NKM, Haarlem, Netherlands

Filed Jul. 22, 1977, Ser. No. 818,059
Int. Cl.² B66C *1/42*
U.S. Cl. 294—110 R **8 Claims**



1. A hoisting apparatus comprising, in combination:

a horizontally elongate yoke having a clamping jaw located at each end thereof, and parallelogram linkage means suspending each clamping jaw from its associated end of the yoke for allowing said clamping jaws to move toward and away from each other respectively to grip and release a load;

a hoisting member slidably received in said yoke between said ends thereof;

linkage means joining each clamping jaw to said hoisting member for supporting said yoke from said hoisting member while urging said jaws together, said linkage means including a lever pivotally connected at one end thereof with one of said clamping jaws, a coupling rod pivotally connected at one end thereof with the other of said clamping jaws and pivotally connected at its opposite end to said lever, and load suspension linkage means pivotally depending from said hoisting member and pivotally connected to said lever; and

lock means for automatically connecting said yoke directly to said hoisting member when said clamping jaws are spread apart in load-releasing position.

4,133,571
EXPANDABLE CAMPER BODY

Frank T. Fillios, 53 Hillside Ter., Belmont, Mass. 02178

Filed Feb. 7, 1977, Ser. No. 766,832
Int. Cl.² B60P *3/32*
U.S. Cl. 296—23 C **3 Claims**

1. An expandable camper body for mounting on a truck chassis comprising:

a forward fixed section including a roof, two spaced parallel side walls, a floor and a front wall, said forward section being mounted on a truck chassis;

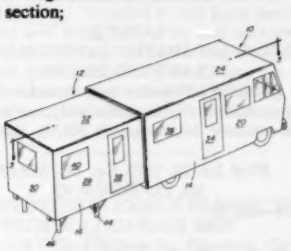
an aft section including a roof, two spaced parallel side walls, a floor and a rear wall, said aft section being movable in and out with respect to said forward section in telescoping fashion;

a support and guide mechanism to guide and support said aft section as it is extended from and retracted into said forward section;

said guide and support mechanism further comprising:

a pair of spaced apart, parallel longitudinal rectangular depressions forming tracks recessed in the floor of said forward section;

a pair of spaced apart support and guide tracks extending rearward from said van chassis, each of said support tracks having a longitudinal rectangular depression forming a longitudinal extension of said tracks in said forward section;



at least two vertical adjustable legs for each of said support and guide tracks;

horizontal support braces positioned between said support and guide tracks to maintain proper track alignment;

a plurality of wheels mounted on the underside of said aft section to ride in said recessed tracks in said forward section and in said support and guide tracks;

drive means to move said aft section along said depressed tracks to extend and retract said aft section;

said drive means further comprising:

a gear rack mounted on the underside of said aft section;

a spur gear mounted at the rear of said van chassis which engages said gear rack;

an electrical motor to drive said spur gear.

4,133,572

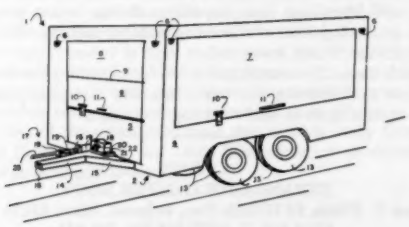
UTILITY TRAILER

Sammy L. Robbins, Route 2, Box 327, and Bobby D. Armour, Rte. 2, both of Natchitoches, La. 71457

Filed Jul. 5, 1977, Ser. No. 812,482

Int. Cl.[2] B60P *3/34*

U.S. Cl. 296—23 R **12 Claims**



1. A utility trailer comprising:

(a) a chassis;

(b) a floor fastened to said chassis;

(c) oppositely disposed storage bins positioned on said floor and extending upwardly in stacked relationship with a bottom inside portion open to the inside, and a coextensive bottom outside portion closed and forming side panels of said trailer, and a top outside portion open to the outside above said side panels;

(d) a pair of longitudinal frame members spanning the length of and carried by each of said storage bins in vertical, spaced relationship, respectively; a pair of bracket mounts spanning the width of said trailer and carried by the bottom ones of said longitudinal frame members at each end of said bracket mounts and an end panel bracket fitted to each end of said bracket mounts beneath and in essentially parallel relationship to said longitudinal frame members;

(e) movable side panels normally closing over said top outside portion of said storage bins in closed configuration, and capable of opening and slidably retracting between said longitudinal frame members to expose said top outside portion of said storage bins; and

(f) movable end panels normally closing over at least a portion of the front and rear of said trailer, respectively, in closed configuration, and capable of opening and slidably retracting on said end panel bracket to provide access to the interior of said trailer.

4,133,573

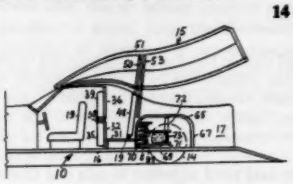
AUTOMOBILE BODY

Henry C. Zur, 10 W. Griswold, Phoenix, Ariz. 85021

Filed Sep. 15, 1976, Ser. No. 723,448

Int. Cl.[2] B62C *1/06*; B62D *33/02*

U.S. Cl. 296—26 **14 Claims**



1. In an automobile including a front seat, a windshield and a permanent roof extending rearwardly from the windshield over said front seat; a body comprising:

(a) a fixed body part comprising a floor and walls upstanding from side edges of said floor with the walls supporting said permanent roof;

(b) an adjustable roof hingedly connected to the front edge of said permanent roof and comprising a top and side panels depending from said top wall and overlapping said side walls;

(c) a sealing strip carried by each of said panels at the lower edges thereof and engaging said walls; and

(d) means for holding said adjustable roof in an elevated position relative to such fixed body,

(e) a rear seat comprising a seat panel, a pad on said panel, a back panel pivotably connected to said seat panel and presenting top and side edges, and a pad on said back panel; and in which the means for securing the rear seat in the vertical position comprises complemental elements on the top and side edges of the seat panel and on the side walls and roof.

4,133,574

GUARD-CAB FOR COLD ROOM

Robert P. Martin, 7809 W. 130th St., Parma, Ohio 44130

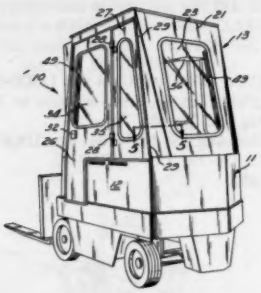
Filed Oct. 26, 1976, Ser. No. 735,680

Int. Cl.[2] B62D *25/02*

U.S. Cl. 296—28 C **17 Claims**

1. A lift truck comprising a wheel-supported body, an electric motor on the body for driving the truck through at least one of the wheels, a battery on the body for energizing the drive motor, an operator station on the body, a cab enclosing the operator station, said cab having a plurality of panels in-

cluding a top, a plurality of windows carried by said panels, the major area of said panels and said windows being thermally insulated, electrical resistance heater means arranged to heat the interior of the cab, thermostatic control means sensitive to



the air temperature within the cab, and an electric circuit connecting said heater with said battery through said thermostatic control means whereby said cab is maintained at a temperature selectively determined by said thermostat.

4,133,575

VIBRATION DAMPING MEANS FOR WINDSHIELD

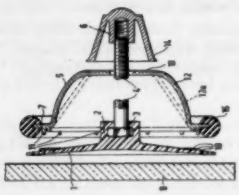
Elmar Mäder, Bohlingen, Germany, assignor to ever-clean GmbH H.W. Nixdorf, Düsseldorf, Germany

Filed Nov. 29, 1976, Ser. No. 745,561

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1975, 2553486

Int. Cl.² B60J 1/20

U.S. Cl. 296—95 R **11 Claims**



1. Means for damping vibrations in a windshield, comprising a suction-type mounting assembly to be mounted on the internal surface of said windshield having:

a. a suction cup consisting at least partially of resilient material and having a central region and a peripheral marginal portion, said cup being adapted to engage at least with said peripheral marginal portion the internal surface of the windshield and to therewith a peripheral seal;

b. a bell member extending over the outer surface of fthe central region of the suction cup and having a peripheral flange portion adapted to bear against said suction cup substantially along said marginal portion thereof.

c. resilient ring means mounted on the peripheral flange portion of said bell member; and

d. fastening means which are accessible from the outside and act between the central region of the suction cup and said bell member, said fastening means when tightened drawing the suction cup into the interior of said bell member for increasing the cavity between said internal surface of said windshield and said suction cup, whereby said mounting assembly adheres to said internal surface of the windshield and, through said peripheral marginal portion of the suction cup engaging the windshield, absorbs or at last substantially dampens vibrations occuring in the windshield, said resilient ring means being compressed between the peripheral flange portion of said bell member and the peripheral marginal portion of said suction cup so as to increase the vibration damping and to provide additional security for the seal.

4,133,576

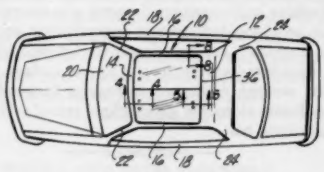
HATCH FOR VEHICLE ROOFS

Richard R. Chrysler, 8940 Rickett Rd., Brighton, Mich. 48116

Filed Aug. 17, 1977, Ser. No. 821,041

Int. Cl.² B60J 7/10

U.S. Cl. 296—137 B **14 Claims**



1. A hatch assembly for vehicle roofs comprising; an opening in said vehicle roof, said opening having a frame structure around its perimeter, a pair of panels covering said opening, said panels being disposed in substantially the same plane and in side by side relationship to each other, latch means associated with said pair of panels and having a locked position to hold said panels closed relative to said opening and on said frame and an open position permitting removal of said panels from said opening, said latch means permitting hinging movement of said pair of panels from said closed to a predetermined partially open position while said panels remain attached to said frame.

4,133,577

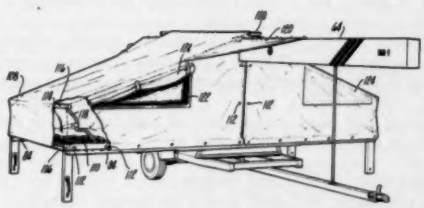
BOAT TRAILER CONVERTIBLE TO TENT SHELTER

Thomas M. Pilant, 1247 E. Lincoln, Birmingham, Mich. 48008

Filed Sep. 13, 1976, Ser. No. 722,808

Int. Cl.² B60P 3/34

U.S. Cl. 296—23 B **19 Claims**



16. A boat trailer arrangement comprising a trailer frame, a pair of road engaging wheels and means supporting said trailer frame on said wheels, a drawn bar member connected to said trailer frame and extending forwardly thereof; coupling means carried at the outer portion of said draw bar adapting said trailer to be coupled to a towing vehicle; an A-frame enclosure secured to said trailer frame located centrally on said boat trailer axis, said A-frame enclosure having a sloping side member inclined inwardly of said trailer axis; respective pairs of spaced boat hull rests secured to the sides of said A-frame enclosures, said boat hull rests also including boat hull retaining pockets formed at the lower outward portion thereof, respective pairs of clamp arm members; a pair of cross members secured to said A-frame enclosure at the front and rear sides thereof extending transversely to the boat trailer axis;

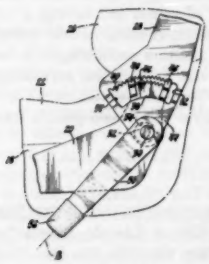
means pivotally connecting one end of each of said clamp arms to an outer extremity of said cross-members, said clamp arms having concavely configured contours adapted to engage a boat hull disposed in said boat hull rest members upon swinging movement about said pivotal support into engagement with said boat hulls; means for releasably retaining said clamp arm members in engagement with a boat hull disposed in said respective boat hull rest members, said means including respective pairs of clamp arm extension members pivotally connected to the free end of said clamp arm members, said clamp arm extension members being of sufficient length to overlap said boat trailer axis of said A-frame enclosure, said clamp arm members positioned opposite each other whereby said clamp arm extension members may be overlapped with each other, means locking said overlapped clamp arm extension members together, an elongated storage compartment secured to said A-frame enclosure and positioned so that said clamp arm extension members overlap to the upper surface thereof, said elongated storage enclosure extending forward of said A-frame enclosure along the longitudinal axis of said trailer parallel to said draw bar.

4,133,578

SEAT BACK ADJUSTING MECHANISM

Richard E. Fancy, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 21, 1977, Ser. No. 853,109
Int. Cl.[2] A47C *1/025*; B60N *1/06*
U.S. Cl. 297—370 **1 Claim**



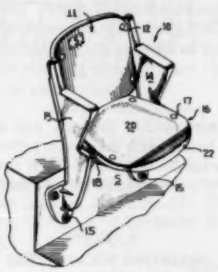
1. A simple and compact mechanism for supporting a seat back in various angular position on a seat cushion, comprising: a substantially planar seat back mounting member adapted to be attached to the seat back; a seat cushiom mounting member adapted to be attached to the seat cushion and with a rearward end portion having an upwardly directed toothed sector thereon; said rearward end portion also having a uniformly circular aperture therein located below the toothed sector; a circular shaft extending through said aperture and dimensioned sufficient to permit rotation therein without body shifting movement; said shaft having an integral cylindrical end portion with its axis offset from the remainder of the shaft, thus forming an eccentric portion thereon; said seat back mounting member having a bore formed therein at the lower end for encircling the integral eccentric end portion; said seat back mounting member further having an elongated opening formed therein above said bore and with an arcuate upper edge configured with a continuously toothed profile for engagement with said upwardly directed toothed sector; the lower end portion of the seat back mounting member which houses said bore being offset from the plane of the toothed portion thereof to simultaneously allow alignment of said toothed portions of the seat back and cushion mounting members as well as the lower end and the eccentric portion of said shaft; an operating lever means attached at one end to said integral eccentric portion with the other end accessible for manual manipulation to rotate the shaft in an unlatching movement whereby the integral eccentric portion thereon is moved upward thus raising said seat back mounting member to disengage said toothed portions to permit subsequent angular adjustments therebetween.

4,133,579

STADIUM, GYMNASIUM OR LIKE CHAIR

Billy J. Springfield, Temple, Tex., assignor to American Desk Manufacturing Co., Temple, Tex.

Filed Aug. 29, 1977, Ser. No. 828,871
Int. Cl.[2] A47C *7/02*
U.S. Cl. 297—452 **26 Claims**



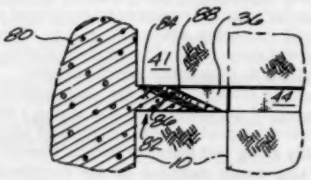
1. A seat comprising a top wall merging with front, rear and a pair of opposite side walls, a bottom wall merging with said front, rear and pair of opposite side walls, said seat being of a generally one-piece homogenous plastic blow-molded construction with a parting line along said front, rear and pair of opposite side walls, and portions of said top and bottom walls being compression fused to each other adjacent said side walls thereby forming reinforced areas adapted for securement to a conventional chair seat support bracket.

4,133,580

ISOLATION OF IN SITU OIL SHALE RETORTS

Gordon B. French, Bakersfield, Calif., assignor to Occidental Oil Shale, Grand Junction, Colo.

Filed Jul. 15, 1977, Ser. No. 815,797
Int. Cl.[2] E21C *41/10*; E21F *15/00*
U.S. Cl. 299—2 **21 Claims**



7. A method for forming a gas barrier in a retort access drift adjacent a fragmented permeable mass of formation particles in an in situ oil shale retort in a subterranean formation containing oil shale comprising the steps of:

providing a mass of formation particles in the retort access drift having a face approximately at the angle of repose of fragmented formation; and

applying a substantially gas impermeable layer to the face of the mass of formation particles in the drift.

4,133,581

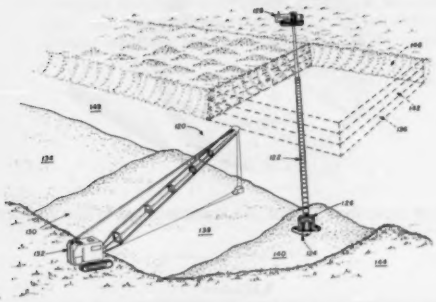
METHOD OF STRIP MINING WITH CABLE SUPPORTED CONVEYOR

Charles R. Satterwhite, 15920 Coolwood, Dallas, Tex. 75248

Continuation of Ser. No. 774,974, Mar. 7, 1977, abandoned, which is a continuation of Ser. No. 620,585, Oct. 8, 1975, abandoned, which is a division of Ser. No. 413,537, Nov. 7, 1973, abandoned. This application Oct. 28, 1977, Ser. No. 846,316

Int. Cl.[2] E21C *41/00, 47/00*

U.S. Cl. 299—7 **9 Claims**



1. In a strip mining process of the type in which overburden covering an ore-bearing layer is excavated to facilitate mining of the ore-bearing layer, the improvement comprising:

extending at least one cable across the excavation from a point adjacent the unexcavated overburden to a point above a previously mined portion of the excavation;

supporting an aerial conveyor from the thus extended cable;

removing overburden from one side of the excavation in accordance with a predetermined sequence of vertical zones including a topsoil zone and at least one subsoil zone and thereby progressively uncovering additional portions of the ore-bearing layer;

receiving the removed overburden on the serial conveyor and conveying the removed overburden across the excavation to a point above a previously mined portion of the excavation;

discharging the removed overburden from the conveyor and thereby refilling the previously mined portion of the excavation in accordance with the same sequence of vertical zones so that all of the overburden from the subsoil zone is positioned in a layer characterized by a substantially horizontal upper surface, said layer lying beneath all of the overburden from the topsoil zone and thereby facilitating return of the mind area to productive usage.

4,133,582

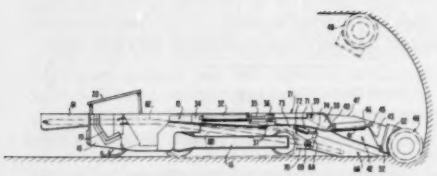
LOW PROFILE MINING MACHINE

Wilhelm J. Kogelmann, R.D. #1, Box 255-C, Boalsburg, Pa. 16827

Filed Oct. 18, 1977, Ser. No. 843,221

Int. Cl.[2] E21C *27/24*

U.S. Cl. 299—64 **17 Claims**



1. A mining machine comprising a vehicular frame, a vertical axis turret on the vehicular frame whose top surface defines the top of the mining machine above ground level, a depressed bearing support means for the turret on the vehicular frame at an elevation below the top surface of the turret, a mined material gathering head pivotally mounted on the forward end of the vehicular frame at an elevation below said turret, a vertically swingable boom carried by the turret and extending forwardly of the turret and adapted to swing through an arc well above the top surface of the turret and having a forward end cutting head, forward end cantilevered extension means on the turret projecting forwardly thereof and downwardly and disposed above a medial portion of the gathering head, horizontal axis pivot means for said boom on said cantilevered extension means, boom lifting and lowering cylinder means connected with the boom and connected with the cantilevered extension means below and forwardly of said horizontal axis pivot means and above a medial portion of said gathering head, said lifting and lowering cylinder means disposed bodily above said gathering head, and the top surface of said turret, said boom pivot means and the connection of said cylinder means with said cantilevered extension means of the turret lying in closely adjacent substantially horizontal planes.

4,133,583

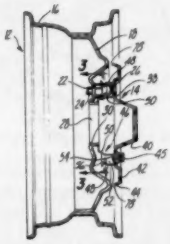
WHEEL AND TRIM ASSEMBLY

Edward G. Spisak, 35700 Oakwood La., Westland, Mich. 48185

Filed Dec. 1, 1977, Ser. No. 856,308

Int. Cl.[2] B60B *7/06*

U.S. Cl. 301—37 TP **9 Claims**



1. A wheel and trim assembly including a wheel having wheel mounting holes arranged on an annular circle to receive complementary mounting studs, nuts adapted to be mounted on said studs to retain said wheel in position, said nuts each having an annular retaining portion, said retaining portions being disposed in substantially the same plane, an ornamental wheel trim, retaining means forming part of said wheel trim and being engageable with said annular retaining portions at radially outward location on said nuts to prevent relative axial movement of said trim and said wheel, guide means on said wheel trim engageable with said nuts to obstruct attachment of said wheel trim except upon orientation of said trim and wheel in selected positions, said guide means including an annular wall having an outer surface with a diameter greater than the diameter of a circle passing through the radial inner surfaces of each of said nuts, and a plurality of radially inwardlly extending recesses formed in said wall to receive said plurality of nuts when said trim is oriented in said selected positions.

4,133,584

BRAKE FLUID PRESSURE CONTROL VALVE OF A DECELERATION SENSING TYPE

Takaaki Ohta, Okazaki, and Tomoyuki Nogami, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Feb. 23, 1978, Ser. No. 880,426

Claims priority, application Japan, Mar. 15, 1977, 52-31381

Int. Cl.[2] B60T *8/14*

U.S. Cl. 303—24 C **10 Claims**

1. A brake fluid pressure control valve of a deceleration sensing type comprising:

a valve housing interposed in the rear brake circuit which connects the master cylinder and the rear wheel cylinders in a vehicle braking system and provided with an air chamber and a first and a second hydraulic pressure chambers formed on either side of said air chamber;

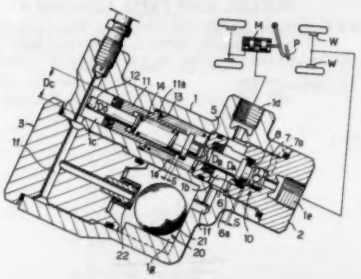
a first plunger retained in said valve housing axially slidably and fluid-tightly, with one end thereof extending into said first hydraulic pressure chamber and with the other end extending into said air chamber;

means for interrupting said rear brake circuit when said first plunger is shifted a certain preset distance toward said air chamber;

a communicating passage for transmitting the hydraulic pressure in said rear brake circuit into said second hydraulic pressure chamber;

an inertia valve interposed in said communicating passage being actuated, when the deceleration rate of a vehicle has exceeded a predetermined value, to interrupt said communicating passage;

a second plunger retained in said valve housing axially slidably and fluid-tightly, with one end thereof extending into said second hydraulic pressure chamber and with the other end thereof extending into said air chamber as well as being axially slidable to contact with said first plunger;



a third plunger having an annular cylindrical configuration retained in said second plunger axially slidably and fluid-tightly, with one end thereof extending into said second hyraulic pressure chamber and with the other end thereof extending into said air chamber as well as coaxially confronting to said first plunger;

a first spring member disposed between said second plunger and said valve housing for biasing said second plunger in the direction away from said first plunger;

a second spring member disposed between said first plunger and said third plunger for biasing said both plungers in the direction of keeping away from each other; and

an axial-direction gap provided between said first plunger and second plunger in such a manner that said gap does exist even under braking application when the vehicle is empty, but disappears under braking application at least when the vehicle is fully loaded.

4,133,585

RESILIENT FOIL JOURNAL BEARING

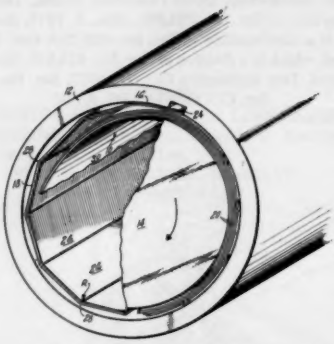
Lazar Licht, San Mateo, Calif., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 4, 1977, Ser. No. 822,012

Int. Cl.² F16C *17/16*

U.S. Cl. 308—9 **14 Claims**

1. In a journal bearing comprising a stationary retaining member having a bore, a rotating journal having a bearing surface and, within said bore, a resilient foil-insert having a bearing surface wherein a fluid film is induced between said bearing surfaces, the improvement in said foil-insert which comprises a continuous length of foil having a portion thereof initially preformed to the shape of an open polygon and coiled within said bore, said initial polygon having a plurality of rounded vertices of prescribed curvatures and a plurality of sides joining and tangent to said rounded vertices, said sides



being of prescribed lengths and being inclined to one another at prescribed angles.

4,133,586

AXIAL SLIDE BEARING

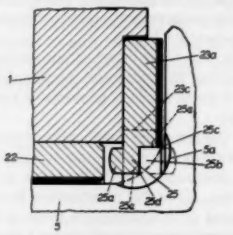
Friedel Maurer, Walluf, Germany, assignor to Glyco-Metall-Werke, Daelen & Loos GmbH, Wiesbaden-Schierstein, Germany

Filed Aug. 5, 1977, Ser. No. 822,249

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1976, 2656306

Int. Cl.² F16C *43/02*

U.S. Cl. 308—23 **6 Claims**



1. In a bearing wherein a rotatable shaft is journalled in a radial bearing carried by a support, said shaft having oppositely facing bearing surfaces lying in parallel planes at opposite ends of said radial bearing, there being an annular space between the ends of said radial bearing and the adjacent shaft bearing surface, bearing elements mounted on said support independently of said radial bearing and having axially facing surfaces for thrust bearing engagement with said shaft bearing surfaces, and asymmetrical projecting means on said bearing elements adapted when said bearing elements are correctly mounted on said support to be received in said space and adapted when said bearing elements are incorrectly mounted on said support for interfering engagement with said shaft.

4,133,587

BEARING WITH AN INTERMEDIATE RACE

Takeshi Kume, Amagasaki, Japan, assignor to Suehiro Seiko Co., Ltd., Hyogo, Japan

Filed Jun. 9, 1977, Ser. No. 805,125

Claims priority, application Japan, Jun. 21, 1976, 51-73664

Int. Cl.² F16C *19/22, 33/34*

U.S. Cl. 308—183 **5 Claims**

1. A bearing comprising

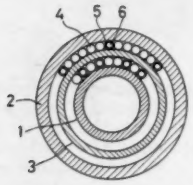
at least one idling member rotatable between and substan-

tially concentrically with a fixed member and a rotating member and

a plurality of elastic sleeve and roller sets distributed between said idling member and at least one of said rotating and fixed members, such that in each of said sets said sleeve is compressed radially against two points on said roller between said members,

said sleeve enclosing therewithin said roller and said roller having a diameter slightly smaller than the inner diameter of said sleeve,

the number of the sleeve and roller sets being selected so as to adjust the relative frictional resistance between said fixed and idling members and between said idling and rotating members, thereby allowing said idling member to



rotate at a predetermined speed as said rotating member rotates.

4. A sliding bearing comprising

at least one idling member rotatable slidably between and substantially concentrically with a fixed member and a rotating member and

a predetermined number of elastic sleeves distributed in spaces formed between said idling member and at least one of said rotating and said fixed members, such that said sleeve is compressed radially between said members,

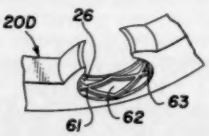
the number of said sleeves being selected so as to adjust the relative frictional resistance between said rotating and idling members and between said fixed and idling members, thereby allowing said idling member to rotate at a predetermined speed as said rotating member rotates.

4,133,588

BALL SEPARATOR FOR BALL BEARING

Melvin L. Earsley, Lubbock, Tex., assignor to Industrial Molding Corporation, Lubbock, Tex.

Filed Jan. 6, 1978, Ser. No. 867,315
Int. Cl.² F16C *33/38*
U.S. Cl. 308—201 **13 Claims**



1. In a ball separator for use in a ball bearing which includes confronting first and second races, and a plurality of spherical balls coacting with said races; said ball separator including an annular base, and a plurality of annularly spaced fingers projecting from said annular base to define individual annularly spaced ball pockets; said ball separator having opposite side walls, and being configured to be received between the outer and inner races of said ball bearing with said side walls confronting respective races; each of said ball pockets being formed to partially enclose a respective ball, and having a wall surface with an effective diameter larger than the diameter of said ball, thereby providing a clearance space between the pocket wall surface and said ball; the improvement comprising:

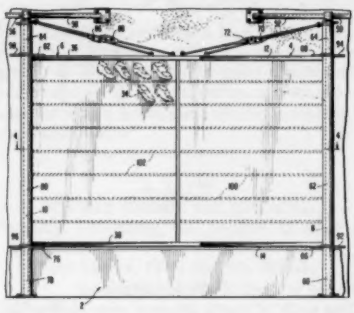
each pocket wall surface having integral projections formed thereon, defining ball engaging surfaces having an effective diameter slightly larger than the diameter of said ball to provide a small clearance between said projections and said ball.

4,133,589

SHOE DISPLAY DEVICE AND METHOD

Robert L. Johns, P.O. Box 2897, Vero Beach, Fla. 32960

Filed Oct. 20, 1976, Ser. No. 734,250
Int. Cl.² A47F *7/08*
U.S. Cl. 312—125 **6 Claims**



1. An open front shoe display device to maximize the efficient merchandizing of shoes while mitigating pilferage which comprises:

a first display unit comprising horizontal top and bottom frames, a vertical central panel, a vertical first side frame and a vertical second side frame, said first side frame being perpendicular to said central panel, said second side frame forming an acute angle with the front side of said central panel and said central panel dividing said first unit into a first front compartment and a first rear compartment,

a second display unit comprising horizontal top and bottom frames, a vertical central panel, a vertical third side frame and a vertical fourth side frame, said central panel and side frames of said second unit being of substantially the same height as the central panel and side frames of said first unit, said third side frame being perpendicular to said second unit central panel, said fourth side frame forming an obtuse angle with the front side of said second unit central panel, the sum of said obtuse angle and said acute angle of said first unit being substantially 180°, said second unit central panel dividing said second unit into a second front compartment and a second rear compartment,

a pair of vertical shafts spaced apart a distance substantially equal to the horizontal width of said first unit plus the horizontal width of said second unit,

said first display unit being rotatably mounted at the front vertical edge of said first side frame upon one of said shafts,

said second display unit being rotatably mounted at the front vertical edge of said third side frame upon the other of said shafts,

said first and second rear compartments having means to hold shoes arranged in horizontal rows, and

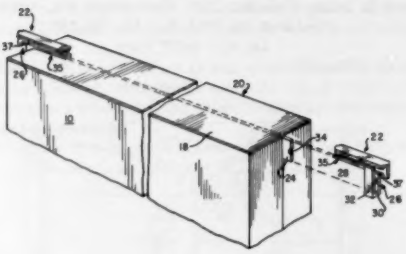
said first and second front compartments having means to hold shoes in display positions in horizontal rows and at an acute angle relative to said central panels comprising shoe sole supports plus heel ledges.

4,133,590

BOUND VOLUME SUITABLE FOR FILING CABINET STORAGE

Raymond R. Young, Glenview, Ill., assignor to Wilson Jones Company, Chicago, Ill.

Filed Mar. 31, 1976, Ser. No. 672,121
Int. Cl.[2] A47B 63/00
U.S. Cl. 312—183 4 Claims



1. A bound volume of sheets comprising:

(a) a first stack of sheets disposed over each other, each of said sheets having an edge in alignment with corresponding edges on the other sheets of said first stack, said edges forming a first substantially continuous surface;

(b) bar means of a length longer than said edges having two ends disposed adjacent said first stack and having a surface in alignment with and substantially flush with said first substantially continuous surface, the ends of said bar means extending beyond two opposite ends of said first substantially continuous surface;

(c) a second stack of sheets disposed adjacent said bar, each of said sheets having an edge in alignment with corresponding edges on the other sheets of said second stack, said edges forming a second substantially continuous surface, said first and second substantially continuous surfaces and the aligned surface of said bar means together forming a single substantially continuous surface and the ends of said bar means forming supports for engagement by an engaging structure in a storage device;

(d) said stacks of sheets having their aligned edges and said aligned surface of said bar being adhesively bound into a unit along said single continuous surface by a layer of adhesive therealong; and

(e) said layer of adhesive serving as the sole means for securing said bar and said stacks of sheets into a unit,

(f) a pair of caps adapted to mate with and be secured to said ends and to support said bound volume in a support device, wherein each of said caps comprising:

(1) a body defining a channel which extends in the same direction as said bar means and is adapted to engage the end of said bar means;

(2) engagement arm means secured to said body and extending in said same direction along the length of said bar means and positioned, configured and dimensioned to engage said single substantially continuous surface when said cap is slidably advanced onto said end; and

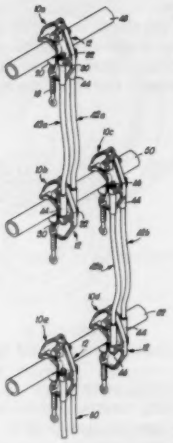
(3) Means to engage a bar which extends in a second direction substantially transverse to the direction in which said bar means extends.

4,133,591

GROUND CLAMP FOR DUAL ELECTRICAL CABLE TERMINALS

Edward L. West, and Melvin E. Clutter, both of Centralia, Mo., assignors to A. B. Chance Company, Centralia, Mo.

Filed Jul. 27, 1977, Ser. No. 819,294
Int. Cl.[2] H01R 3/06, 11/10
U.S. Cl. 339—14 L 6 Claims



1. A conductor clamp, comprising:

a generally C-shaped body presenting a concave, conductor-gripping surface;

a jaw oriented in spaced, opposed relationship to said conductor-gripping surface for cooperatively gripping a conductor with the latter;

means shiftably mounting said jaw on said body;

an elongated, threaded clamping bolt operatively connected to said body and jaw for selective, alternate opening and closing movement of the latter relative to said conductor-gripping surface; and

structure integral with said body for presenting at least a pair of spaced unitary elements defining cable-receiving passages therethrough, said elements being oriented such that the respective longitudinal axes of said cable-receiving passages are generally in perpendicular relationship relative to one another and one of said axes is substantially parallel to the longitudinal axis of said bolt.

4,133,592

STACKED PRINTED CIRCUIT BOARDS AND CIRCUIT BOARD SYSTEM

Robert F. Cobaugh, Elizabethtown; Edward C. Dowling, Harrisburg, and Attalee S. Taylor, Palmyra, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

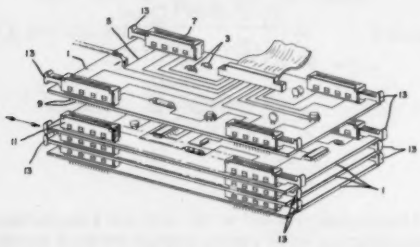
Continuation of Ser. No. 630,859, Nov. 11, 1975, abandoned.
This application Jun. 29, 1977, Ser. No. 811,010
Int. Cl.[2] H05K 1/08
U.S. Cl. 339—17 M 19 Claims

1. A printed circuit board system comprising:

at least three parallel spaced printed circuit boards having conductive contact receiving means positioned on both surfaces of each board, predetermined ones of said contact receiving means on one side of a board being electrically connected to said contact receiving means on the other side of the same board by means of a conductor positioned in an aperture passing through said board,

electrical connector means positionable back-to-back between adjacent boards and contacting said contact receiving means on corresponding facing surfaces of adjacent boards, and

wherein preselected ones of said contact receiving means on both sides of a given board and the facing sides of each board adjacent said given board lay along straight lines which are normal to the planes of said boards, and electrically conductive means releasably interconnecting said



back-to-back electrical connector means to enable the continuation of selected circuit paths through or to three or more boards through said electrical connector means positioned back-to-back with respect to each other and positioned between adjacent boards.

4,133,593

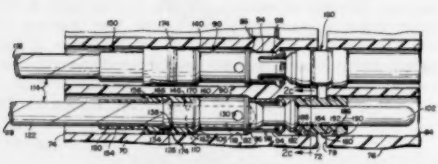
PRESSURE SENSITIVE SEAL FOR WIRE AND INTERFACE SEALING OF INDIVIDUAL CONTACTS IN AND BETWEEN ELECTRICAL CONNECTORS

Norbert L. Moulin, Placentia, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 633,185, Nov. 19, 1975, abandoned, which is a continuation of Ser. No. 423,028, Dec. 10, 1973, abandoned, which is a division of Ser. No. 240,501, Apr. 4, 1972, Pat. No. 3,792,416. This application Mar. 25, 1977, Ser. No. 781,084

Int. Cl.[2] H01R *13/52*

U.S. Cl. 339—94 R **18 Claims**



1. A pressure sensitive seal for sealing means for terminating electromagnetic signal carrying means within a termination body having means therein for defining a bore, comprising:

means for defining a resilient seal positionable in the bore means for enabling a sealable engagement between the bore means and a peripheral portion of the termination means, said resilient seal means including means responsive to pressure for enhancing the sealing engagement against entry of fluids into the bore means when pressures external to the bore means exceed pressures internal to the bore means and for permitting exhaust of fluids from the bore means when pressures internal to the bore means exceed pressures external to the bore means.

4,133,594

SELF-LOCKING CONNECTOR

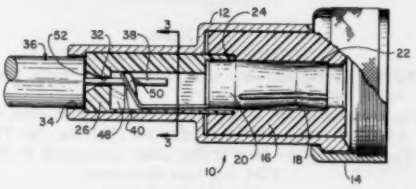
Eric W. Laverick, Enfield, Conn., and Clyde E. Wesp, Hillsdale, N.J., assignors to HI-G, Incorporated, Windsor Locks, Conn.

Filed Jun. 7, 1977, Ser. No. 804,447

Int. Cl.[2] H01R *17/04*

U.S. Cl. 339—95 D **8 Claims**

1. An electrical conductor connector comprising an insulating body having a conductor entry opening at one end of the body and beveled cam shoulders adjacent the opening forming a passage which tapers towards said entry opening, and means including a strip of conductive material having a bifurcated end forming a pair of contact legs defining a slot therebetween registering with the opening, the contact legs being movable into a locking position in engagement with said cam shoulders to apply a predetermined conductor locking force upon con-



ductor entry between the contact legs, the contact legs in locking position cooperating with said cam shoulders with outer portions of said contact legs being slidable along said cam shoulders and being urged towards each other to increase said locking force upon application of a force tending to effect conductor withdrawal.

4,133,595

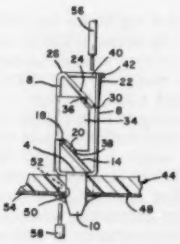
DOUBLE ENDED RECEPTACLE

James Pritulsky, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 6, 1978, Ser. No. 883,621

Int. Cl.[2] H01R *9/08*

U.S. Cl. 339—95 D **13 Claims**



1. A double ended receptacle terminal which is receptive to a conductor at each end thereof, said receptacle terminal comprising:

a stamped and formed channel-shaped member having a web and first and second sidewalls extending from said web, said sidewalls having free ends which are remote from said web, said web constituting one end of said receptacle terminal and said free ends constituting the other end thereof,

an opening in said web for reception of a conductor, a first integral contact spring extending from a location adjacent to said first sidewall obliquely away from said web and towards said second sidewall, said first spring having a free end which is adjacent to said second sidewall whereby upon insertion of a conductor through said opening and between said free end of said first spring and said second sidewall, said spring is flexed and establishes electrical contact with said conductor,

a second integral contact spring extending from said free end of said second sidewall obliquely towards said first sidewall and towards said web, said second spring having a free end which is adjacent to said first sidewall whereby, upon insertion of a conductor between said free end of said second spring and said first sidewall, said second

spring is flexed and electrical contact is established with said conductor, and

overstress prevention means between said springs, said overstress prevention means comprising ear means extending between said sidewalls, said ear means having one portion which serves as a stop for said first spring and another portion which serves as a stop for said second spring upon flexure of said springs.

4,133,596

ELECTRICAL CONNECTOR

William C. Dauser, Jr., 458 Melody La., North Muskegon, Mich. 49445

Continuation-in-part of Ser. No. 591,490, Jun. 30, 1975, Pat. No. 4,013,332. This application Mar. 16, 1977, Ser. No. 778,145

The portion of the term of this patent subsequent to Mar. 22, 1994, has been disclaimed.

Int. Cl.² H01R 9/08

U.S. Cl. 339—98 **41 Claims**

1. An electrical connector assembly adapted to be electrically conductively connected to an elongated conductor comprising: a conductor engaging connector means including a base with two elongated legs extending from said base and spaced from each other, said legs including at least two sides thereof intersecting to form cutting edges; said combined legs in transverse cross section at their widest point being defined by an outline which is elongated in shape; a base member having a positioning means for positioning a conductor to be oriented in a first predetermined direction; opening means in the base member intersecting said positioning means, the overall combined, transverse, cross-sectional shape of said opening means defined by an outline which has an elongated shape essentially the size and shape as said outline defining the overall shape of said legs at their widest point; said elongated outline of said opening means extending longitudinally in a direction oblique to said first predetermined direction of said positioning means whereby when said legs and a conductor are moved relative to one another said cutting edges pierce the conductor located within said positioning means and thereby providing an electrical connection between said connector means and the conductor.

4,133,597

SUPPORT RAIL FOR TERMINAL BLOCKS

Jean Debaigt, Maisons Laffitte, France, assignor to CGEE Alsthom, Levallois Perret, France

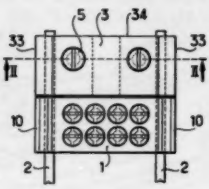
Filed Feb. 27, 1978, Ser. No. 881,338

Claims priority, application France, Mar. 1, 1977, 77 05927

Int. Cl.² H01R 9/16

U.S. Cl. 339—125 R **4 Claims**

1. A support rail for terminal blocks, the support rail being constituted by two bars held parallel to each other by at least one spacer, said at least one spacer comprising a parallelepipedical insulating block which has an upper surface, a lower surface, two longitudinal walls and two side surfaces, said block having a transverse channel which is parallel to each of said longitudinal walls, and which has a cross-section which corresponds to that of the bars and which has one of the bars passing through it, said block at said channel having, on the side of the longitudinal wall a longitudinal slot which is open to



said longitudinal wall and on the other side a longitudinal slot and a tightening screw passing through the block between its upper surface and its lower surface.

4,133,598

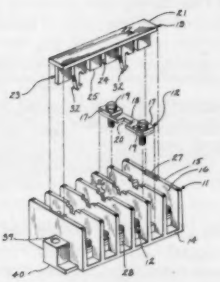
TERMINAL BLOCK

Donald W. Kuntzsch, Brookfield, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Nov. 14, 1977, Ser. No. 851,153

Int. Cl.² H01R 9/16

U.S. Cl. 339—198 G **5 Claims**



1. A terminal block which comprises:

a moled base including a bottom member, a set of barriers rising from the bottom member and spaced apart to define a plurality of channels, a surface which is recessed from the bottom member to form a cavity, a plurality of pedestals each formed in a respective channel above the cavity, one pedestal having an aperture therethrough which communicates with the cavity;

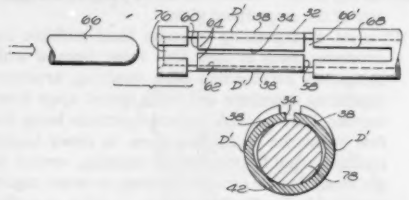
a plurality of wire terminal units, each disposed on a respective pedestal; and

a molded insert fastened to the base to hold the wire terminal units in position, the insert including a strip which is disposed longitudinally across the barriers, a plurality of integrally formed retaining members disposed below the strip and located to hold the terminal units in position; and an integrally formed fastening member depending from one of the retaining members and through the pedestal aperture, the fastening member having a portion that is adapted to be secured in the cavity of the base.

4,133,599
SOCKET CONTACT

Lloyd J. Powell, Newmarket, Canada, assignor to International Telephone & Telegraph Corp., New York, N.Y.

Continuation of Ser. No. 704,120, Jul. 12, 1976, abandoned. This application Aug. 15, 1977, Ser. No. 824,343
Int. Cl.[2] H01R *13/12*
U.S. Cl. 339—258 R 4 Claims



1. An electrical connector comprising: a pin contact, said pin contact having a circular external surface portion of a predetermined uniform outside diameter therearound; and a hollow tube-like socket contact to receive said pin contact, said socket contact having a longitudinal slot therethrough at one angular position therearound, said socket contact having different stressed and unstressed inside diameters around the approximately symmetrical axis thereof at different angular positions such that when said pin contact is inserted into the interior of said socket contact, said socket contact engages and exerts pressure upon said pin contact at approximately diametrical opposite locations therearound at said one angular position, the unstressed inside diameter of said socket contact at said one angular position being smaller than said predetermined diameter, said socket contact being stressed when said pin contact is inserted thereinto, one inside diameter of said socket contact at a location about 90 degrees from said one angular position being larger than said predetermined diameter when said socket contact is unstressed, said one inside diameter also being larger than said predetermined diameter when said socket contact is stressed and said pin contact is inserted into said socket contact, said socket contact having a notch therethrough at each end thereof transverse to and through said slot, and one member at least at one end of said socket contact fixed thereto, said one member having a stiffness greater than that of said socket contact, another member being fixed to the other end of said socket contact, said other member also having a stiffness greater than that of said socket contact.

4,133,600
METHOD OF MANUFACTURING AND UTILIZING HOLOGRAPHIC LENS MEANS

James T. Russell, and Bernard P. Hildebrand, both of Richland, Wash., assignors to Eli S. Jacobs, New York, N.Y.

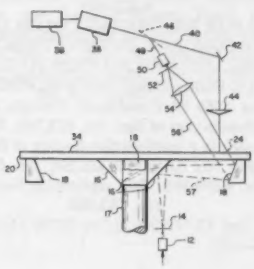
Filed Oct. 1, 1976, Ser. No. 728,872
Int. Cl.[2] G02B *27/17*
U.S. Cl. 350—3.72 9 Claims

1. The method of recording and reading out information on a sensitive plate means comprising:

forming a holographic lens on a rotatable member provided with photosensitive material including generating an object beam and a reference beam characterized by mutually coherent radiation, directing said object beam and said reference beam at an angle to one another to expose the photosensitive material on said member for generating an interference pattern in said photosensitive material, directing said object beam to provide an elongated focus as the object for generating said interference pattern, developing said photosensitive material to provide a holographic lens, and rotating said member and re-exposing said photosensitive material to provide further holographic lenses,

locating said sensitive plate means adjacent said holographic lenses of said rotatable member,

rotating said member and consecutively directing a reconstruction beam through said holographic lenses to said plate means to reproduce said elongated focus at said plate means,

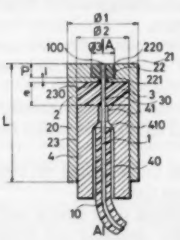


and providing relative movement between said member and said plate means for tracing light paths on said plate means with said elongated focus.

4,133,601
OPTICAL FIBERS BUNDLE POSITIONING FERRULE

Benoit Le Guen, and André Jacques, both of Paris, France, assignors to Thomson-CSF, Paris, France

Continuation-in-part of Ser. No. 672,602, Apr. 1, 1976, abandoned. This application Nov. 22, 1976, Ser. No. 744,024
Claims priority, application France, Nov. 21, 1975, 75 35651
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.21 18 Claims



1. A positioning terminal for at least one optical fibre provided with a protective sheath, said terminal having an external cylindrical surface of revolution about an axis acting as a positioning reference for said fibre, and comprising:

an external body having a lateral and a front wall; said external cylindrical surface and an internal cylindrical surface of same said axis bounding at least part of said lateral wall and parallel outer and inner plane faces bounding said front wall;

a right circular cylindrical internal body force-fitted in said internal cylindrical surface, abutting against said inner face and made of a material with a coefficient of compression by volume substantially greater than that of the constituent material of said external body; and

a plunger smoothly sliding inside said internal cylindrical surface for bearing on said internal body and thus providing a compressional strain thereof; .

said front wall, said internal body and said plunger respectively defining first, second and third portions of a single bore of same said axis for receiving said optical fibre free of said protective sheath, the cross-sections of said first and second bore portions being greater than that of said fibre;

and said internal body being capable, under said compressional strain, of tightly squeezing said optical fibre in said

second bore portion to position it coaxial with said external surface.

4,133,602

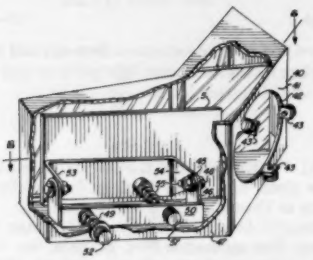
METHOD FOR PRODUCING COLOR STRUCTURE CHANGE THROUGH INTERACTION OF LIGHT SOURCES AND APPLICATION TO IMPROVED APPARATUS FOR STEREOSCOPIC PHOTOGRAPHY

James E. Ihms, 1569 W. Hazelwood, Phoenix, Ariz. 85018

Continuation-in-part of Ser. No. 412,760, Nov. 5, 1973, abandoned, which is a continuation-in-part of Ser. No. 375,335, Jul. 2, 1973, Pat. No. 3,846,810, and Ser. No. 536,448, Dec. 26, 1974, Pat. No. 4,009,951. This application Nov. 19, 1976, Ser. No. 743,460

Int. Cl.² G03B *21/14*; G02B *27/22*

U.S. Cl. 350—132 **4 Claims**



1. An apparatus for simultaneously combining one image of an object with another image of the object comprising:

a color filter means,

a first means for directing a first image of the object along a first light ray path through said filter means to form a color filtered image ray,

a second means for directing a second image of the object along a second light ray path and forming a second light ray,

a display medium for receiving the color filtered image ray and said second light ray,

a color compensating filter means, and

a third means for directing the image displayed on said display medium through said color compensating filter means to form a non-anaglyph, full-colored composite image from the interaction of said color filtered image ray and said second light ray having a three-dimensional appearance on a displaying means.

4,133,603

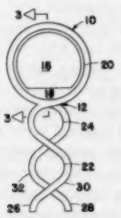
EXTRA HAND MAGNIFYING GLASS

Hajime Inouye, deceased, late of Seattle, Wash., by Mika Inouye, executrix, 3722 E. John St., Seattle, Wash. 98122

Filed May 25, 1977, Ser. No. 800,239

Int. Cl.² G02B *7/02*

U.S. Cl. 350—248 **1 Claim**



1. An extra hand magnifying glass assembly resiliently, compressibly and comfortably supportable on a person's thumb or finger to provide a magnifying glass to be used during reading and sewing, comprising:

(a) a magnifying glass;

(b) a one piece body arranged in one geometric plane and made of moldable resilient plastic material, comprising, in turn:

(1) a completely surrounding edge receiving structure at the top to fully receive the entire peripheral edge structure of the magnifying glass;

(2) a set of depending opposite hand multiple curved structures, each at their tops being integral with the completely surrounding edge receiving structure and depending therefrom and being spaced apart from one another, their multiple curved structures being formed first below the magnifying glass, to create together a resulting small flexible circular opening, second, below this small flexible circular opening, to create together a resulting larger flexible circular opening to resiliently, compressibly, and comfortably receive a person's thumb or finger, and third below this larger flexible circular opening receiving a thumb or finger, to create a crossover lever arms to which a compressive force is applied to move the crossover lever arms together and thereby to relatively move the set of depending opposite hand multiple curved structures temporarily enlarging the second larger flexible circular opening to receive and thereafter to close comfortably around a person's thumb or finger, and

(c) a means to hold the magnifying glass within the completely surrounding edge receiving structure at the top of the one piece body.

4,133,604

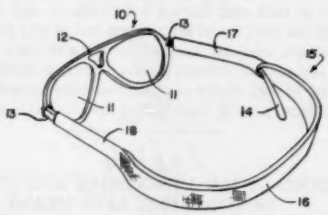
EYEGLASS RETAINER

Robert B. Fuller, Box 153, Wilson, Wyo. 83014

Filed Aug. 15, 1977, Ser. No. 824,261

Int. Cl.² G02C *3/00*

U.S. Cl. 351—123 **4 Claims**



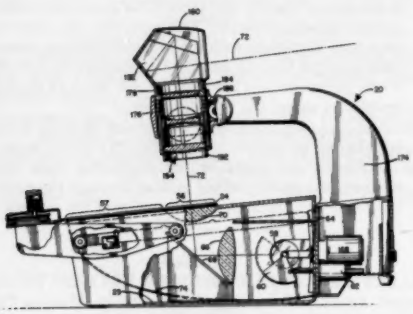
1. An eye-glass retainer comprising a band of material, means at opposite ends of said band forming tubular members secured to said band and open at both ends, said band and tubular members being from a unitary piece of material, said means forming the tubular members comprising end portions of the band rolled into open ended tubes and held in tubular shape, said material comprising an elastic material having a fabric backing on at least one side thereof and lining the interior of said tubular members, the tubular members being of size to slip over and grip the temples of eye-glasses to be retained, and said band being of length to exert a resilient rearward force on the eye-glasses when in place around the head of a wearer of such eye-glasses on which the tubular members are placed, said elastic material constituting means for resiliently transmitting tension said from the band to the tubular members and said fabric backing constituting means for transmitting the resilient force to sid temples and which fabric will tend to elongate and tighten onto the temples of the eye-glasses under the action of said force.

4,133,605

PREVIEW AND PROJECTION SYSTEM FOR SLIDES STORED IN SPACED, CO-PLANAR RELATION IN A PLANAR HOLDER

Blanton C. Wiggin, 144 Forest St., Wellesley, Mass. 02181

Filed Jun. 29, 1976, Ser. No. 700,739
Int. Cl.[2] G03B *21/132, 21/28, 23/08*
U.S. Cl. 353—21 15 Claims



1. A transparency projection system for projecting transparencies that are stored in spaced, co-planar relation in a light transmitting, planar holder without removing the transparencies from the holder, comprising in combination:

a. a planar slide holder having a plurality of spaced, co-plannar slide positions with means at each of said slide positions for holding a slide;

b. optical means for forming a naturally oriented image at an image plane of an object at an object plane, said optical means including an optical apparatus for directing a light beam from a first axial path to a second axial path which is substantially normal to the first axial path, said second axial path being rotatable about the first axial path, said optical apparatus comprising:

(1) a circular track centered about and transverse to said first axial path;

(2) a head arranged for rotating on said track and about first axial path;

(3) a first mirror fixed within said head for rotation thereby, said first mirror being oriented for substantialy right angle deflection of the light beam from the first axial path to an axial path transverse thereto;

(4) second and third substantially right angularly deflecting mirrors;

(5) means for mounting said second and third mirrors within said head for rotation about said transverse axial path with the transverse axial path intersecting said second mirror and with said second axial path intersecting said third mirror; and,

(6) means for gearing said second and third mirror mounting means to said circular track for rotation of said second and third mirrors with and at half the angular rate of rotation of said head;

c. means for supporting the transparency holder at the object plane;

d. means for relatively moving the transparency holder with respect to the optical axis of said image forming means; and,

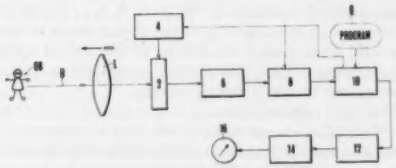
e. light source means for illuminating at least a portion of the object plane positioned transparency holder so that at least one of the transparencies stored therein can be imaged by said image forming means.

4,133,606

METHOD AND SYSTEM FOR DETECTING SHARPNESS OF AN OBJECT IMAGE

Kazuya Hosoe, Machida; Tsuyoshi Asaeda, Sagamihara; Hideo Yokota, Tokyo, and Tamotsu Shingu, Zushi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 11, 1975, Ser. No. 631,133
Claims priority, application Japan, Nov. 13, 1974, 49/130635
Int. Cl.[2] G03B *3/00*
U.S. Cl. 354—25 4 Claims



1. An automatic focusing system comprising:

(A) an image forming optical system having an optical axis and shiftable along the axis so as to form an object image on a predetermined imaging plane;

(B) driving means operatively coupled with said optical system for shifting the optical system along the optical axis;

(C) image sensing means comprising n photosensitive elements addressed differently from each other one plane, said sensing means being disposed at positions to receive the object image formed by the optical system on said imaging plane, said n-photosensitive elements serving for producing respective output signals corresponding to the light intensity impinging thereon;

(D) scanning means for repeatedly scanning the object image on the imaging plane during the shifting of the optical system by said driving means and for sequentially sending out each analogue output of said n-photosensitive elements of said image sensing means in the order of each address of said n-photosensitive elements, said scanning means being electrically connected to each of said n-photosensitive elements;

(E) A - D converting means to convert each analogue output of the n-photosensitive elements being sent out sequentially by said scanning means into a digital signal, said converting means being electrically connected to said image sensing means;

(F) a processing device for consecutively taking each address signal of the n-photosensitive elements addressed in turn by said scanning means and the digital signals being produced by said A - D converting means and for evaluating the distribution of the specific spatial frequency spectrum in the image light beam forming the object image; on the basis of a Fourier-function; wherein said processing means includes:

(F-1) a function value generating means to produce a sine-cosine function value of said specific spatial frequency on each address of the n-photosensitive elements, said generating means being electrically connected to said scanning means for producing the function value in response to each address signal;

(F-2) multiplying means to calculate a product of said sine-cosine function value and the digitally converted value of the output of the photosensitive element at the address corresponding thereto; said multiplying means being electrically connected to said function value generation means and said A-D converting means;

(F-3) first accumulating means to consecutively add the values calculated by said multiplying means cumulatively for calculating the total sum of said products on all of the n-photosensitive elements, said accumulating means being electrically connected to said multiplying means;

(F-4) second accumulating means to consecutively add the

digital signals being produced by said A-D converting means cumulatively for calculating the total sum of said digital signals on all of the n-photosensitive elements, said accumulating means being electrically connected to said A-D converting means;

(F-5) dividing means to divide the value calculated by said first accumulating means by the value calculated by said second accumulating means, said dividing means being electrically connected to said first and second accumulating means;

(F-6) first register means to record the value calculated by said dividing means as an l'th (l=1, 2, 3, . . .) scan is completed when the scanning of the object image is repeated several times during the shifting of the optical system by the driving means, said register means being electrically connected to said dividing means;

(F-7) second register means to record the calculated value of said dividing means as an (l-1)th scan is completed when the scanning of the object image is repeated several times during the shifting of the optical system by the driving means, said second register means being electrically connected to said first register means and recording the value calculated by said dividing means as the (l-1)th scan on said first register means when l'th scan is completed; and

(F-8) comparing means to judge which one of the value recorded by said first and second register means is larger than the other when each scan is completed, said comparing means being electrically connected to said first and second register means and producing a predetermined control signal when the values recorded by said registers become at least equal to each other; and

(G) control circuit means to stop said driving means in response to said predetermined control signal produced by said comparing means, said circuit means being electrically connected to said driving means and said comparing means;

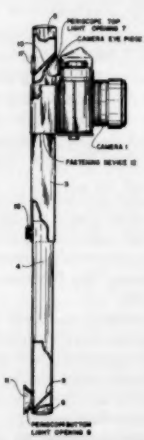
so as to achieve automatic focusing of the image forming optical system on the object.

4,133,607

CAMERA ACCESSORY

Etsuo Mansho, 94-1334 Hiana Pl., Waipahu, Hi. 96797

Filed Nov. 11, 1977, Ser. No. 850,722
Int. Cl.[2] G03B *29/00*
U.S. Cl. 354—81 **2 Claims**



1. A camera accessory for enabling a photographer having a predetermined height to position a camera at a height greater than the predetermined height and take a picture from the greater height with complete physical and visual control, the camera having an eye piece for visual observance of a scene prior to photographing the scene, said camera accessory comprising

a periscope unit having a substantially tubular member adjustable in axial length with spaced opposite top and bottom ends, a top light opening in the tubular member at the top end, a bottom light opening in the tubular member at the bottom end, mirrors in the tubular member directing light from the top light opening to the bottom light opening and an eye piece at the bottom light opening;

fastening means on the tubular member of the periscope unit in the area of the top end thereof for removably affixing a camera to said periscope unit with the eye piece of the camera in alignment with the top light opening whereby a photographer looking into the eye piece at the bottom end of the periscope sees through the eye piece of the camera positioned above the photographer;

an additional light opening in the tubular member at the top end thereof in alignment with the top light opening; and

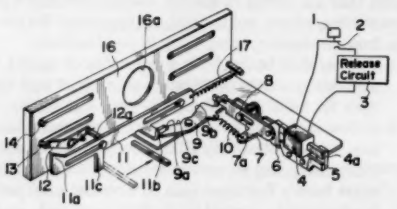
an additional eye piece at the additional light opening whereby the photographer looking through the additional eye piece sees through the eye piece of the camera.

4,133,608

ELECTROMAGNETIC SHUTTER RELEASE DEVICE

Harumi Tanaka, Kobe, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 13, 1977, Ser. No. 805,954
Claims priority, application Japan, Jul. 5, 1976, 51-79062
Int. Cl.[2] G03B *9/08*
U.S. Cl. 354—235 **15 Claims**



1. An electromagnetic release device for use in a camera which includes a shutter, said device comprising:

a shutter release mechanism movable from a cocked position to a rest position for releasing said shutter and from a rest position to a cocked position for releasably locking said shutter in a cocked position;

means for releasably holding said shutter releasing mechanism at its cocked position;

a core;

means for initiating the releasing operation including an armature and being movable to disable said holding means to allow the movement of said shutter release mechanism to its rest position;

a permanent magnet for providing a magnetic attractive force to attract said armature to said core;

a solenoid cooperable with said permanent magnet for substantially cancelling said attractive force upon energization of said solenoid;

means for energizing said solenoid;

means for biasing said releasing operation initiating means to retract said armature from said core and to move said releasing operation initiating means to a position to disable said holding means;

means for charging said biasing means to store a biasing force therein, in response to the cocking of said shutter release mechanism when said armature is attracted on said core; said biasing means, under the stored biasing force, being capable of removing said armature from said core and moving said releasing operation initiation means to a position to disable said holding means upon the cancella-

tion of said attractive force of said permanent magnet and being discharged again after accomplishment of the removal of said armature from said core, and said attractive force of said permanent magnet being greater than said stored biasing force of said biasing means; and

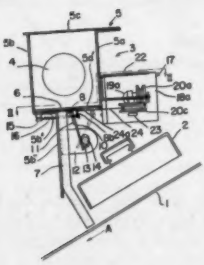
means for resetting or returning said releasing operation initiating means with said biasing means maintained in the discharged condition for resetting said armature onto said core after said releasing operation initiating means disables said holding means.

4,133,609

CHARGE-ERASING DEVICE FOR ELECTROPHOTOGRAPHIC COPYING APPARATUS

Kenichi Arai, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Azuchimachi, Japan

Continuation of Ser. No. 575,744, May 8, 1975, abandoned. This application Jan. 10, 1977, Ser. No. 757,806
Claims priority, application Japan, May 15, 1974, 49-54877
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—3 R **4 Claims**



3. In an electrophotographic copying apparatus including an advanceable substrate and means for electrically charging said substrate and means for exposing said charged substrate to the light image of an original to produce a corresponding latent electrostatic image, a mechanism for erasing redundant charges from said substrate comprising a continuously luminous source of light disposed remote from said substrate, a case enclosing said light source and having therein remote from said substrate a transversely extending elongated slot of a length at least equal to the width of said photosensitive substrate, light conducting means extending between said slot and said substrate and having one end face proximate to and substatially registering with said slot and exposed to said light source through said slot and an opposite end face closely confronting said substrate in the area forward of said charging means in the direction of advance of said substrate and means located proximate said slot for masking selected areas of the ends of said slot whereby to vary the area of said substrate exposed to charge-erasing light transmitted by said light conducting means from said light source through said slot to said substrate.

4,133,610

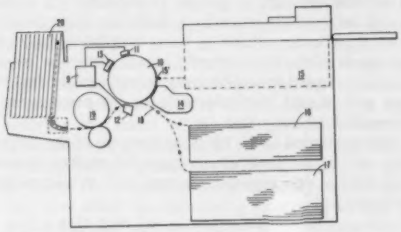
OPTIMUM PRECLEAN CORONA CURRENT FOR ELIMINATING THE ACCUMULATION OF CONTAMINANTS FROM DEVELOPERS

William J. Bernardelli, Longmont; Allison H. Caudill, Lafayette, and John A. Thompson, Boulder, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1977, Ser. No. 866,112
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—3 CH **6 Claims**

6. In an electrophotographic machine including a photoconductor moving sequentially through various process stations including a charging station, an imaging station, a developing station, a transfer station including a transfer corona, and a cleaning station including a preclean corona, the improvement comprising:

means for adjusting the charge density produced on the photoconductor by the preclean corona to approximately



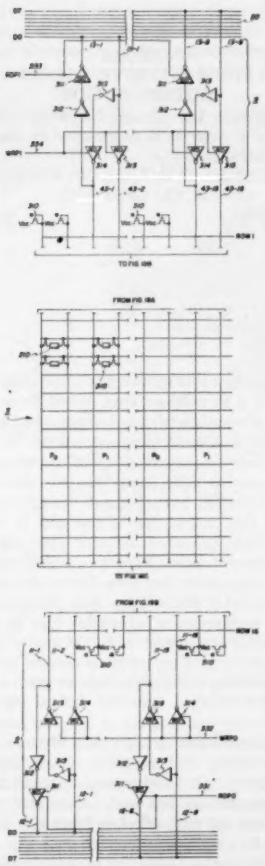
equal the charge density produced on the photoconductor by the transfer corona $\pm 0.025\ \mu C/cm^2$.

4,133,611

TWO-PAGE INTERWEAVED RANDOM ACCESS MEMORY CONFIGURATION

Lamar T. Baker, Manhattan Beach, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 8, 1977, Ser. No. 813,991
Int. Cl.[2] G11C *7/00, 11/40*
U.S. Cl. 365—51 **10 Claims**



1. A memory on a semiconductor chip comprising:

(a) a plurality of memory cells each having a bit sense termi-

nal, said memory cells arranged in a plurality of rows and a plurality of columns wherein each column has a first and a last memory cell;

(b) a plurality of bit sense lines, each one being associated with a particular column by being coupled to the bit sense terminals of the memory cells in said particular column;

(c) means coupled to said bit sense terminal of the first memory cell in said particular column for precharging the associated bit sense line;

(d) means coupled to the bit sense terminal of the last memory cell in said particular column for reading data from and writing data into said memory cells in said particular column; and

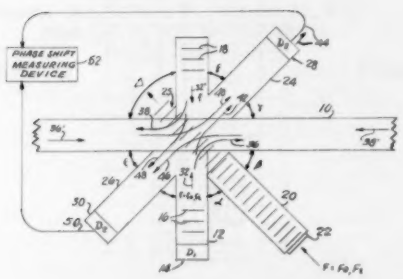
(e) said particular columns arranged such that a first row comprises alternate first and last memory cells associated with particular columns.

4,133,612

ENDLESS FIBER INTERFEROMETER ROTARY MOTION SENSOR

Charles M. Redman, Las Cruces, N. Mex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 6, 1977, Ser. No. 813,361
Int. Cl.[2] G01B 9/02
U.S. Cl. 356—350 **10 Claims**



1. A rotary motion sensor, which comprises:

means for generating a coherent optical signal at a first frequency;

an endless, closed-loop, multiple-turn fiber interferometer;

means for coupling said coherent optical signal into said interferometer in first and second opposed directions;

means for generating first and second reference optical signals which are each offset in frequency from said first frequency by a second frequency;

means for coupling said coherent optical signals traveling in said first and second opposed directions out of said fiber interferometer after multiple traversals thereof;

means for mixing said coherent optical signals coupled out of said interferometer with said first and second reference signals, respectively to produce first and second signals of substantially the same frequency; and

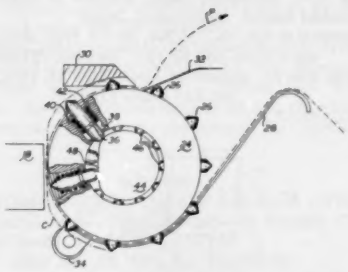
means for detecting the relative phase shift between said first and second signals.

4,133,613

PRINTER PAPER FEEDER

Lyle B. Webster, Port Washington, N.Y., assignor to Harris Corporation, Cleveland, Ohio

Continuation of Ser. No. 711,598, Aug. 4, 1976, abandoned. This application Feb. 24, 1978, Ser. No. 881,059
Int. Cl.[2] B41J 11/27, 11/70
U.S. Cl. 400—616.3 **1 Claim**

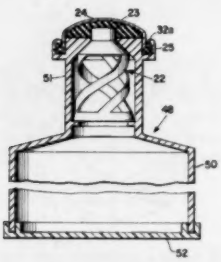


1. Apparatus for imparting information to sheet material provided with feed holes arranged along two lines respectively extending parallel to and in close proximity with the left- and rightward margins of said sheet material, comprising: a generally cylindrical platen about which said sheet material is to be disposed, said platen being rotatably driven about the cylindrical axis thereof by drive means and having a plurality of radially extending feeder pins disposed at spaced circumferential positions thereabout and at two axial positions along said platen, said axial and circumferential positions of said pins being selected so that each of said pins will be received by a corresponding said feed hole of said sheet material when said sheet material is disposed thereabout, said feeder pins being radially moveable between a normal extended position wherein said pins protrude outward from said platen and positively engage said feed holes and a retracted position wherein said pins are substantially received within said platen; a recording station disposed at a first fixed circumferential position adjacent said platen and axially moveable between a range of axial positions, including the axial positions occupied by said pins, for imparting information to said sheet material; a sheet material cutoff bar extending axially along and adjacent to said platen at a second fixed circumferential position, said sheet material cutoff bar being spaced apart from said platen by a distance which is smaller than the distance by which said feeder pins extend from said platen when in said normal extended position, but having notches therein to allow passage of said feeder pins therepast when said feeder pins are in said extended position, said sheet material being arranged to pass between said sheet material cutoff bar and said platen; drive means operatively associated with said platen for rotating said platen in a first direction about its axis so as to drive said sheet material first past said recording station and then past said sheet material cutoff bar; and, retracting means for placing each of said feeder pins in said retracted position only when said pin is passing said recording station and for otherwise placing said pins in said normal extended position so that said pins are retracted when passing said recording station and do not interfere with the operation of said recording station but are extended when passing said sheet material cutoff bar so that said sheet material is positively engaged by said feeder pins through the cooperation of said feeder pins with said sheet material cutoff bar, and is thus positively driven beyond said recording station and past said sheet material cutoff bar.

4,133,614
DAUBER AND METHOD OF ASSEMBLY

John R. Baginski, and William H. Goodpastor, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 23, 1976, Ser. No. 708,144
Int. Cl.[2] B43K 5/00; B43M 11/06
U.S. Cl. 401—206 4 Claims



1. A method of assembling the applicator portion of a dauber comprising a porous pad, a discrete, substantially rigid and unsplit retaining ring, and a body having an annular inner rim having a right-cylindrical-shape outwardly facing surface, an annular outer rim having a right-cylindrical-shape inwardly facing surface and an upwardly open U-shape annular channel intermediate said right-cylindrical-shape surfaces, said rims and said channel being so sized with respect to said pad and said ring that the peripheral portion of said pad and said retaining ring have an interference fit in said channel when the peripheral portion of said pad is partially wrapped about said retaining ring and said retaining ring is disposed in said channel, said pad being retained in said applicator when assembled by the method which comprises the steps of:

positioning said pad with respect to said channel so that the peripheral portion of said pad is disposed superjacent said channel;

placing said retaining ring superjacent said peripheral portion of said pad so that said peripheral portion of said pad is intermediate said ring and said channel; and

telescoping said retaining ring into said channel so that said peripheral portion of said pad is concurrently pulled into said channel and said peripheral portion of said pad becomes substantially wrapped into an upwardly open U-shape annulus about said retaining ring.

4,133,615
MICROPROCESSOR-BASED, PROGRAMMED TURBINE SPEED CONTROL SYSTEM

William E. Zitelli, Monroeville Borough, and James M. Mussler, Bethel Park, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 14, 1977, Ser. No. 787,636
Int. Cl.[2] F01D 17/06
U.S. Cl. 415—43 7 Claims

1. A microprocessor-based speed control system energized by an electrical power source for controlling the speed of a steam turbine over a wide speed range from turning gear to substantially synchronous speed by controlling the steam admission thereto from a steam supply source using a hydraulically operated servomotor throttle valve, said system comprising:

a plurality of read-only-memories permanently preprogrammed with sets of digital instructions and data words in an addressable order for characterizing the speed control operation of the control system;

means for generating a system clock signal;

a microprocessor governed by the system clock signal to process the sets of instructions and data words of the programmed read-only-memories synchronous to the system clock signal;

means for temporarily storing a plurality of data words resulting from the processing operations of the microprocessor;

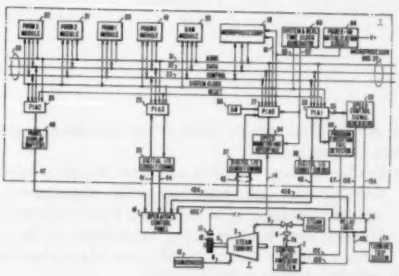
means responsive to electrical power turn-on to generate an initialization signal to said microprocessor, said microprocessor being responsive to said initialization signal to initialize the status of the microprocessor-based speed controller to a predetermined initial state by processing an initialization set of said sets of digital instruction and data words of the preprogrammed read-only-memories;

a real time clock for generating interrupts to said microprocessor, said microprocessor being responsive to said interrupts, only after processing said initialization set of digital words, to segregate its central processing activities into processing time intervals;

means for generating a signal representative of actual turbine speed;

first means, coupled to the microprocessor and functionally operative in cooperation therewith, for converting the signal representative of actual turbine speed to at least one speed measurement data word corresponding to each generated interrupted as governed by the processing of a first set of instructions and data words by the microprocessor for use thereby;

said microprocessor being operative to process a second set of said sets of instruction and data words to calculate a new value of measured turbine speed during each process-



ing time interval in a first set of said segregated processing time intervals based on a function of a present value of measured turbine speed and the values of a predetermined number of speed measurement data words, both corresponding concomittantly with the processing time interval during which the new speed value is being calculated;

said microprocessor being further operative to process a third set of said sets of instruction and data words to reduce the error between each new value of measured turbine speed and a value of speed reference substantially concurrent therewith over said wide speed range by generating a control data word which is based on a real time function of said substantially concurrent measured and reference values of turbine speed, said third set of instructions being processed during each processing time interval in a second set of said segregated processing time intervals;

second means, coupled to the microprocessor and functionally operative in cooperation therewith, for converting said control data word generated by the microprocessor to a speed control signal as governed by the processing of a fourth set of instructions and data words by the microprocessor; third means governed by the speed control signal to modulate the pressure of a hydraulic fluid signal which is coupled to the servomotor throttle valve for controlling the position thereof; and

a control panel, coupled to the microprocessor and functionally operative in cooperation therewith, for entering data thereto and displaying data therefrom and selecting at

least one of a plurality of predetermined speed control operating modes of the speed control system, said microprocessor being responsive to said panel mode selection, data entries and data displays in accordance with the processing of a fifth set of instructions and data words thereby.

4,133,616

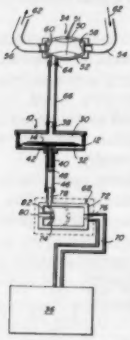
STROKE VOLUME LIMITER FOR COLLAPSIBLE WALL BLOOD PUMP SYSTEM

Victor L. Poirier, Chelmsford, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

Division of Ser. No. 647,679, Jan. 9, 1976, Pat. No. 4,023,468. This application Mar. 1, 1977, Ser. No. 773,378

Int. Cl.[2] F04B *9/12, 35/02, 43/10*

U.S. Cl. 417—384 **1 Claim**



1. A blood circulatory assist device operated by pneumatic pulses comprising:

a flexible bladder enclosed in a rigid housing, said bladder forming inlet and outlet means for intermittently admitting and discharging blood to and from the interior of said bladder, said bladder being expandable to its fully distended position under the influence of the blood pressure;

a cylindrical pneumatic chamber;

wall means dividing said chamber into the opposing compartments pneumatically sealed from each other, said wall means being mounted for reciprocal displacement between the opposing compartments of said chamber in response to pressure differential thereacross;

means forming a port from a first of said compartments for receiving pneumatic pulses;

a closed pneumatic system including as a part thereof the interface between said bladder and the interior of said housing and the second of said compartments, said closed pneumatic system providing a path of pneumatic communication between said second compartment and said interface for transmitting pneumatic pulses from said second compartment to said interface to collapse said bladder;

reciprocally mounted stop means engagable with said wall means for variably limiting reciprocal movement of said wall means to thereby limit the magnitude of the pneumatic pulses transmitted to said closed system independently of the magnitude of the pneumatic pulses received at said port;

a hood threadedly engaging the cylindrical wall of said chamber external thereof;

means connecting said hood and said stop means whereby rotary movement of said hood advances or retracts said stop means with respect to said wall means, and

means permitting said hood to rotate relative to said stop means for preventing transmission of rotational forces to said wall means.

4,133,617

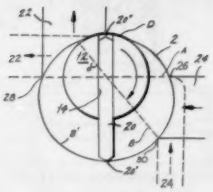
VANE TYPE PUMP WITH OPTIONAL HIGH RATE OF FLOW OR HIGH PRESSURE CHARACTERISTICS

Denis A. L. M. Reynaud, Mexico City, Mexico, assignor to Thomas Roach, Hazelwood, Mo.

Continuation-in-part of Ser. No. 652,795, Jan. 27, 1976, abandoned. This application Mar. 24, 1977, Ser. No. 780,775

Int. Cl.[2] F01C *1/00, 21/10;* **F04C** *1/00*

U.S. Cl. 418—150 **4 Claims**

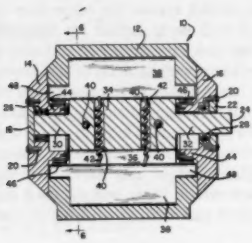


1. A fluid pump comprising, in combination, means defining a housing of straight hollow cylindrical character having a pair of end walls with inner planarwise parallel end faces and an endless wall extending between said end faces and having an inner guide surface defining in a plane normal to the generatrices of said cylinder a cross-sectional contour of a spiral of Pascal, a rotary drum of straight circular cylindrical character extending through the interior of said housing being symmetrically arranged with respect to a plane of symmetry normal to the end faces of the latter and contacting said guide surface along a line in said plane of symmetry, said drum being formed with a diametrically extending groove therethrough, a vane slidably guided in said groove extending in axial direction between said end faces and transversely across the interior of said housing and having opposite edge portions each contacting said guide surface with a line contact, fluid inlet means communicating with the interior of said housing through said endless wall, fluid outlet means communicating with the exterior of said housing through said endless wall, said fluid inlet and outlet means being assymmetrically arranged at opposite sides of said plane of symmetry, said assymetrically arranged fluid inlet and outlet means also providing the least restriction to fluid flow by being located with respect to said rotary drum and associated slidably mounted vane by an angle of intercommunication between said fluid inlet and outlet means, twice during each revolution of said drum and associated vane, which angle of intercommunication is defined by first and second intersecting planes, said first plane extending through the axis of said drum and being in general alignment with a marginal surface of one said inlet or outlet means at its area of intersection with said guide surface and intersecting another marginal surface of said other fluid inlet or outlet means at its area of intersection with said guide surface, and a second plane also extending through the axis of said drum and intersecting yet another marginal surface of one of said fluid inlet or outlet means at its area of intersection with said guide surface which is generally opposite to said marginal surface of one of said fluid inlet or outlet means that is in general alignment with said first plane, means providing an automatic seal of liquids formed by pressure in the sector defined by the area between the outlet means and the line of contact between the inner guide surface of the housing and the rotary drum, and a shaft extending co-axially with said rotary drum through one of said end walls and being engaged on said drum for rotation therewith, whereby when said shaft and said drum are rotated with vane will be rotated therewith while oscillating with respect to the drum so as to force fluid entering said housing through said inlet means with increased pressure out said outlet means so that the device will act as a pump.

4,133,618
ROTARY CAM-ACTUATED VANE MACHINE

Ronald E. Smolinski, 4081 Forest Ridge Blvd., Dayton, Ohio 45424

Filed Mar. 21, 1977, Ser. No. 779,918
Int. Cl.[2] F01C 1/00, 21/08
U.S. Cl. 418—258 5 Claims



1. In a rotary machine including a stator housing having an inwardly facing, cylindrical, inner surface defining a chamber, inlet and outlet ports communicating with said chamber, a pair of continuous, substantially circular, outwardly facing cam surfaces fixed with respect to said stator housing and projecting inwardly thereof longitudinally of said chamber, a rotor mounted for rotation in said chamber and having a plurality of substantially radially oriented slots formed therein, and vanes received in said rotor slots, and including flat plate portions terminating in tip portions disposed adjacent said cylindrical inner surface of said stator housing and cam followers projecting outwardly of said vanes longitudinally of said chamber, the improvement comprising:

said cam followers on each of said vanes projecting over and directly adjacent to said outwardly facing cam surfaces,

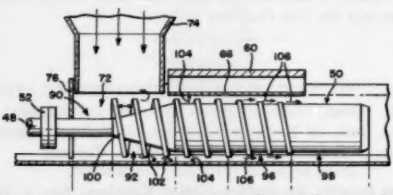
bearing means interposed between said cam followers and said cam surfaces, and

tension means interconnecting said vanes and urging said cam followers thereof into engagement with said cam surfaces and said vane tip portions out of engagement with said stator housing inner surface.

4,133,619
EXTRUSION CASTING APPARATUS

Mark J. Wise, Brookville, Ohio, assignor to The Flexicore Co., Inc., Dayton, Ohio

Filed Sep. 10, 1976, Ser. No. 722,041
Int. Cl.[2] B29B 1/04; B28B 5/00, 21/22
U.S. Cl. 425—64 3 Claims



1. In extrusion casting apparatus for casting an elongated slab having hollow cores extending longitudinally thereof on a substantially smooth flat casting bed using a concrete mix of sufficient dryness to be self-supporting immediately upon extrusion of said slab, including an extruder movable along and over said bed from adjacent an upstream end thereof to adjacent a downstream end thereof and having multiple rotatable augers each consisting of a one-piece shaft and a flight helically encircling part of said shaft, and a feed opening for depositing relatively dry concrete mix through said extruder onto said bed, the improvement comprising:

said one-piece shafts tapering from a minimum diameter portion beneath said feed opening to a maximum diameter portion adjacent their upstream ends substantially equal to the diameter of the hollow cores formed in said slab,

at least part of said minimum diameter portion of said shafts being substantially smooth and free of said flights whereby said relatively dry concrete mix deposited in said extruder can move relatively unimpeded around and beneath said smooth portions of said shafts and onto said bed,

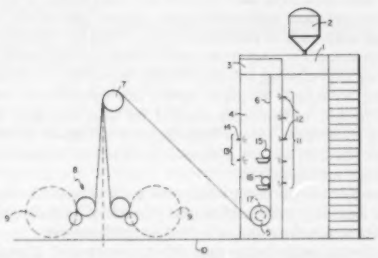
each of said flights having a maximum diameter portion greater in diameter than said maximum diameter of said shafts and a minimum diameter portion substantially equal to said maximum diameter portion of said shafts, and

said flights tapering in an upstream direction from said maximum diameter portions thereof disposed beneath said feed opening to said minimum diameter portions merging with said maximum diameter portions of said shafts.

4,133,620
POLYMER FILAMENT MANUFACTURING DEVICE HAVING REDUCED VERTICAL SIZE

Karl Lehner, Essen, Germany, assignor to Didier Engineering GmbH, Essen, Germany

Filed Aug. 25, 1977, Ser. No. 827,810
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1976, 2638662
Int. Cl.[2] D01D 7/00
U.S. Cl. 425—72 S 10 Claims



1. An apparatus for continuously manufacturing polymer filaments, particularly polyamide or polyester filaments, said apparatus comprising:

means, including a spinning head having spinning nozzles, for continuously extruding a polymer material in liquid form through said spinning nozzles to form downwardly moving filaments;

a blowing shaft positioned beneath said extruding and filament forming means, such that said downwardly moving filaments pass downwardly through said blowing shaft;

a plurality of nozzle means, vertically spaced along the height of said blowing shaft, for blowing cooling air or gas into said blowing shaft and against said filaments in directions transverse to the direction of travel of said filaments through said blowing shaft, and for thereby cooling, solidifying and recrystallizing said filaments during passage thereof through said blowing shaft;

drawing off roller means, positioned within the lower end of said blowing shaft, for feeding said filaments out of said lower end of said blowing shaft in a direction extending obliquely laterally and upwardly therefrom;

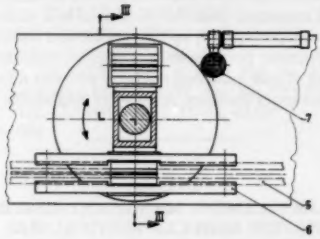
guide roller means positioned downstream of said drawing off roller means, for receiving said filaments directly from said drawing off roller means and for then passing said filaments in a downward direction; and

filament winding means positioned beneath said guide roller means for receiving said filaments directly therefrom and for winding said filaments.

4,133,621
APPARATUS FOR COVERING ELECTRONIC COMPONENTS WITH PLASTIC MATERIAL

Werner Plocher, Horb, and Hans-Martin Lauffer, Hallwangen, both of Germany, assignors to Maschinenfabrik Lauffer & Butscher, Mühlen, Germany

Filed Jun. 16, 1976, Ser. No. 696,580
Int. Cl.[2] B29F 1/10
U.S. Cl. 425—116 7 Claims



1. Apparatus for covering electronic components with a low-pressure molding compound, comprising an assembly of closing units

each of said closing units being rotatable on an axis of rotation and comprises two angularly spaced apart closing sub-units, each closing sub-unit has an open side remote from said axis of rotation and includes mold means located in said open side, said closing sub-units being operable to open and close said mold means, means operatively associated with each of said such closing units for carrying such components to and from each of said closing units,

each of said closing sub-units being movable to a first position, in which its mold means are operable to enclose electronic components carried by said carrying means, and to receive such a molding compound to cover said components, and to a second position in which its mold means are open, and

means operatively associated with each of said closing units for cleaning said mold means of each of said closing sub-units when the same is in said second position,

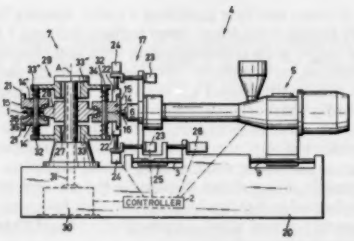
said closing units being operable to move said closing sub-units in alternation to said first position, and to move one of two angularly spaced closing sub-units to said second position while moving the other closing sub-unit to said first position, so that said closing unit is operable for continuous covering of said components, while at the same time being automatically cleaned.

4,133,622
APPARATUS FOR MOLDING INSULATING DISKS ON COAXIAL-CABLE WIRE

Dieter Braun, Schildgen, Fed. Rep. of Germany, assignor to Felten & Guilleaume Carlswerk AG, Cologne, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 785,358, Apr. 7, 1977. This application Jun. 21, 1977, Ser. No. 808,622
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1976, 2614937
Int. Cl.[2] B29F 1/10
U.S. Cl. 425—129 R 20 Claims

1. An apparatus for molding a succession of discrete insulating spacers on an elongated flexible conductor, particularly such which is to be used as an inner conductor of a coaxial cable, comprising a support; a plurality of molds together forming an array which is mounted on said support for displacement in a closed path and has an exposed surface that extends in and along a closed trajectory, each of said molds including a pair of mold members mounted for relative movement toward and away from one another between an open and a closed position and together bounding a cavity in said closed position, and an inlet which extends between said cavity and said exposed surface; means for displacing said array in said path relative to said support so that said exposed surface travels in said trajectory; means for moving said mold members of each respective mold between said positions thereof and for maintaining the same in said open position in a first, and in said closed position in a second, consecutive portion of said path; means for introducing the conductor between said mold members of the respective mold at said first portion of said path for the conductor to extend across the respective cavity in said second portion of said path; means for supplying plastified hardenable material under pressure into said inlet of the respective mold at a predetermined location of said second portion of said path for the material to fill the respective cavity around the conductor, to harden thereabout and thus to form a spacer in said cavity and a sprue in said inlet, in said second portion of said path downstream of said location as considered in the direction of displacement of said array, including a nozzle having an end face which faces said exposed surface of said array at said location and a nozzle end which opens onto said



end face; means for withdrawing the conductor together with the spacer from between said mold members at a withdrawing location situated in said first portion of said path; means for reducing wear of said exposed surface of said array and of said end face of said nozzle, including means for mounting at least said nozzle on said support for movement toward and away from said trajectory at said location, means for urging said nozzle toward said trajectory with a variable force, and control means controlling said means for urging so that said force is overcome by a reaction force with which the material emerging from said nozzle end acts on said end face away from said trajectory, forming a gap therebetween containing a film of the material on said exposed surface which film is integral with the sprue, extends at least between said location and said withdrawing location, separates said end face of said nozzle from said exposed surface of said array, and is in a sliding contact with said end face; and means for severing the sprue from the spacer at said withdrawing location to thereby detach the sprue and the film from the spacer.

4,133,623
PRODUCTION OF RUBBER TUBING FROM LATEX

Alfred R. Bevan, Welwyn Garden City, and Ian Stephens, St. Albans, both of England, assignors to Malaysian Rubber Producers' Research Association, London, England

Filed May 31, 1977, Ser. No. 802,192
Claims priority, application United Kingdom, Jun. 1, 1976, 22688/76
Int. Cl.[2] B29D 23/04
U.S. Cl. 425—133.1 9 Claims

1. A latex extruding apparatus comprising:

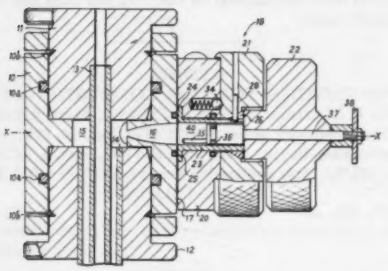
a head block having a central bore therethrough;

two vertically-disposed annular plugs sealingly engaged in said bore through said head block, said annular plugs having coaxially aligned bores therethrough;

two vertically disposed precision tubes, each tube secured at one end respectively in one of said annular plugs, and one of said tubes being arranged coaxially within the other so as to form a vertical annular passage therebetween;

said head block having a chamber formed therein, said chamber being opened to the upper end of said annular passage;

said head block further having an inlet passage therein into said chamber;



container means connected to said inlet passage for supplying latex to said inlet passage and said chamber by gravity; and

means for venting the interior of the inner of said two coaxially aligned precision tubes with the atmosphere.

4,133,624

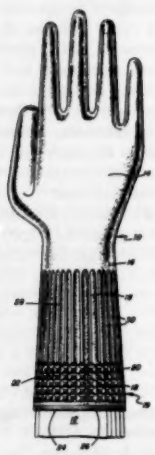
MOLDED GLOVE AND FORM THEREFOR HAVING TEXTURED WRIST PORTION FOR THE ELIMINATION OF CUFF ROLL-DOWN

Paul W. Heavner, Kettering, and William E. LeMay, Waynesville, both of Ohio, assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Division of Ser. No. 723,347, Sep. 15, 1976, abandoned. This application Sep. 6, 1977, Ser. No. 831,037

Int. Cl.² B29C *13/00*

U.S. Cl. 425—275 **4 Claims**



1. In a dip-type mold for a glove defining a hand and wrist portion for forming corresponding hand and wrist portions of a glove molded thereon, said wrist portion defining longitudinal channels positioned about its circumference, the improvement comprising, in combination:

a plurality of first circumferential channels defined on said wrist portion and positioned at an end thereof remote from the hand portion, said circumferential channels crossing said longitudinal channels, to form corresponding channels in a glove molded thereon.

4,133,625

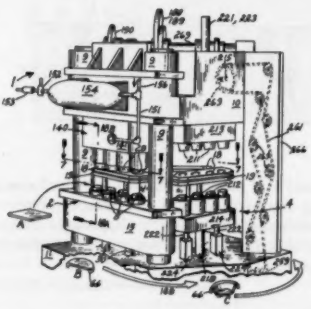
MACHINE FOR FORGING AND THERMOFORMING HOLLOW THERMOPLASTIC BIAXIALLY ORIENTED ARTICLES

Arnold L. Kellermann, Goshen, and David I. McDonald, Cincinnati, both of Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Aug. 2, 1977, Ser. No. 821,176

Int. Cl.² B29C *3/00, 17/04*

U.S. Cl. 425—394 **17 Claims**



1. A machine for transporting a workpiece to a series of workstations arranged in a generally circular path comprising

a machine frame;

a shaft revolvably supported in said frame and having an axis about which it revolves;

a carrier assembly for engagement of at least one workpiece having first and second carrier plates, a die set, and a locking means connected to the die set for locking and unlocking said die set when said shaft is revolved;

said die set further including first and second lip rings for gripping a workpiece respectively mounted on said first and second carrier plates and a generally circular locking ring that is revolvably supported about one of said lip rings, connected to said locking means, and arranged to engage the other said lip ring and lock the two said lip rings into engagement with each other when said locking means is operated responsive to said shaft being revolved; and

a carrier support means mounted between and to one of said shaft and said carrier assembly for supporting the carrier plates of said carrier assembly to revolve with said shaft and for motion relative to and substantially parallel to said shaft axis.

4,133,626

PRESS FOR PRESSING POTLIKE ARTICLES FROM CERAMIC POWDER

Rolf E. R. Schubart, Kochel am See, Fed. Rep. of Germany, assignor to Dorst-Keramikmaschinen-Bau Otto Dorst und Dipl.-Ing. Walter Schlegel, Kochel am See, Fed. Rep. of Germany.

Filed Aug. 15, 1977, Ser. No. 824,268

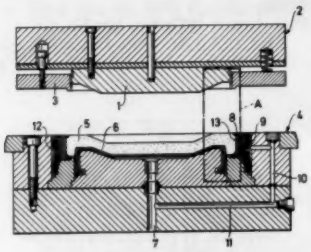
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1976, 2637231

Int. Cl.² B30B *5/02;* B28B *3/00*

U.S. Cl. 425—405 H **7 Claims**

1. A press for pressing pot-like articles from ceramic powder, said articles having a bottom and a vertical peripheral side wall extending substantially at right angles to said bottom, said press having a punch die forming one face of the body of the article and a lower mould having a central cavity; an elastic membrane dividing said central cavity into an upper moulding chamber and a lower pressure chamber; said punch die in one position adapted to close the top of said moulding chamber,

said press characterized by an elastic annular casing surrounding said moulding chamber and spaced from said elastic membrane, a rigid element surrounding said casing; an annular pressure channel between said element and casing; a source of fluid under pressure connected to both said lower pressure



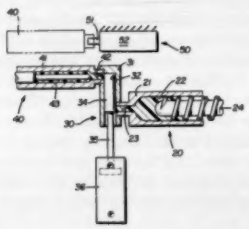
chamber and said pressure channel for simultaneously forcing said casing inwardly toward said elastic membrane and said elastic membrane upwardly to shape and compact ceramic powder confined between in said moulding chamber said elastic membrane, casing and punch die.

4,133,627

APPARATUS FOR MOLDING PLASTIC ARTICLES

Robert F. Kontz, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Aug. 22, 1977, Ser. No. 826,506
Int. Cl.[2] B29D *23/02*; B29F *1/06*
U.S. Cl. 425—525 **6 Claims**



1. An apparatus for forming a plastic article, comprising:

a movable mold having an internal mold cavity and an axial sprue opening;

supply means at a first station for flowing heated, flowable plastic material through the sprue opening to fill the internal mold cavity;

at a second station, an axially reciprocable pressurizing rod and fluid power means for (a) axially displacing the pressurizing rod into the sprue opening to apply pressure to the plastic material within the internal mold cavity and (b) maintaining pressure on the rod while the plastic material within the internal mold cavity is thermally conditioned to a self-sustaining state;

displacement means for moving the mold from the first station along an arcuate path in a plane through the axis of the sprue opening to the second station where the sprue opening is an axial alignment with the axially reciprocable pressurizing rod where the sprue axis in parallel to the position of the sprue axis at the first station;

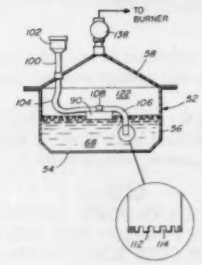
a cylindrical core pin concentrically positioned within the internal mold cavity in axial alignment with the sprue opening, defining an essentially tubular cavity; power means for axially displacing the core pin relative to the internal mold cavity; radially movable neck ring sections surrounding the core pin at a position remote from the sprue opening, the neck ring sections being carried by and mounted to an annular support collar freely movable on the core pin, the collar including compression springs biasing the neck ring sections outwardly, and the mold assembly including circumferential spaced notches to accommodate the radial outward movement of the neck ring sections for releasing the neck of the molded article upon axial withdrawal of the core pin from the internal mold cavity.

4,133,628

VAPOR INJECTOR FOR FUEL COMBUSTION SYSTEM

Charles F. Morrison, 25 Pearl St., Malden, Mass. 02148

Continuation-in-part of Ser. No. 771,718, Feb. 24, 1977, which is a continuation-in-part of Ser. No. 664,967, Mar. 8, 1976, Pat. No. 4,009,984. This application Sep. 19, 1977, Ser. No. 834,179
Int. Cl.[2] F23J *7/00*
U.S. Cl. 431—4 **12 Claims**



1. An apparatus for adding water vapor to a fossil fuel combustion system which system has an air intake assembly for introducing a flow of air into the combustion area of the combustion system which comprises:

(a) a housing;

(b) a reservoir disposed within the housing;

(c) a free-floating platform on the surface of the reservoir;

(d) means to form a vapor chamber above the reservoir;

(e) conduit means secured to the platform and extending a fixed distance into the reservoir and having an upper and a lower end, the lower end in the reservoir and characterized by a plurality of slots for the flow of air therethrough; said fixed distance remaining constant regardless of the level of the water in the reservoir; the upper end of the conduit means isolated from the vacuum chamber; and in communication with ambient;

(f) means to create a pressure differential between the ambient about the housing and the vapor chamber to draw air through the water and into the vacuum chamber forming a saturated air stream which air stream flows through a conduit and into the combustion area of the fuel combustion system.

4,133,629

COMBUSTION SYSTEM CONTROL

William C. Clark, Marton, England, assignor to Phillips Petroleum Company, Bartlesville, Okla.

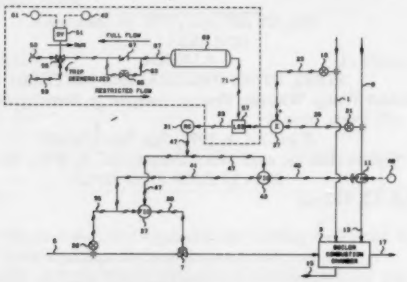
Filed Aug. 2, 1977, Ser. No. 821,253
Int. Cl.[2] F23C *1/00*
U.S. Cl. 431—12 **5 Claims**

1. In a system for combustion of fuel to produce heat in which there are alternate primary and secondary means to supply combustion air and in which the fuel flow controlled by a fuel flow valve, is ratioed to the total air flow, a method for controlling the fuel flow to the combustion chamber on shutdown of operating of the primary means of supplying combustion air, said method comprising:

(a) activating the secondary means for supply of air, and

(b) relaying a first signal to a ratio controller controlling the

fuel flow valve said signal falsely indicating sufficiently low flow of air to the combustion chamber immediately to



reduce flow of fuel to the combustion chamber to a flow within safe limits.

4,133,630

COMBUSTION FLASHLIGHT LAMP

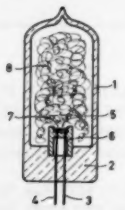
Johannes C. A. Vreeswijk, Terneuzen, and Rudolf M. Kruimink, Eindhoven, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 16, 1977, Ser. No. 769,009

Claims priority, application Netherlands, Mar. 4, 1976, 7602231

Int. Cl.² F27D *1/08*

U.S. Cl. 431—359 **5 Claims**



1. A combustion flash lamp for high-voltage ignition which comprises a lamp envelope, an actinically combustible metal wool disposed in said envelope, an oxidizing gas disposed in said envelope, at least two current conductors extending through the wall of said envelope in a vacuum-tight manner, an insulating surface disposed in said envelope, an ignition mass in said lamp envelope on said insulating surface, said ignition mass being physically connected at all times to each of said two current carrying conductors and electrically conductive only after flashing of said lamp, said ignition mass consisting of a mixture of a binder and other ingredients comprising a metal powder, and an oxidation agent, said other ingredients being 60–90% by volume of a metal powder consisting of 3 parts by volume of zirconium and 0–1 part by volume of another metal and 40–10% by volume of $KClO_4$ or a chemically equivalent quantity of another oxidation agent, said other ingredients being dispersed in said binder.

4,133,631

PHOTOFLASH LAMP ARRAY CIRCUIT BOARD HAVING RADIATION SENSITIVE FUSE ELEMENTS

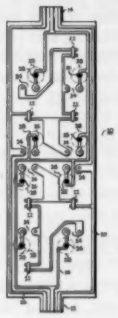
Edward J. Collins, Mentor on the Lake, and Vaughn C. Sterling, Cleveland Heights, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed May 23, 1977, Ser. No. 799,681

Int. Cl.² F21K *5/02*

U.S. Cl. 431—359 **8 Claims**

1. In a circuit board for a photoflash lamp array having a lamp firing circuit pattern deposited on a dielectric substrate and radiation sensitive switches connected in said circuitry for sequential firing of a plurality of flash lamps connected thereto, the improvement wherein radiation sensitive fuse elements are



deposited on said circuit pattern adjacent the associated lamps to physically interrupt the circuit path below upon activation and in a manner which is accompanied by the thermal destruction of the underlying dielectric substrate.

4,133,632

VAPORIZING TYPE OIL BURNER

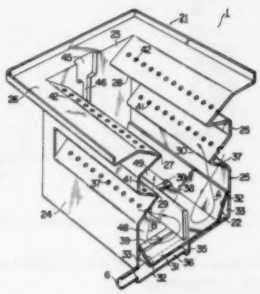
Juichi Nakano, Osaka, Japan, assignor to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Mar. 28, 1977, Ser. No. 781,966

Claims priority, application Japan, Jun. 3, 1976, 51-72360[U]

Int. Cl.² F23D *13/12*

U.S. Cl. 431—328 **5 Claims**



3. A vaporizing type oil burner comprising:

a vaporizer pot;

a fuel vaporization promoting plate formed of a thin sheet of porous metallic material of a three-dimensional mesh structure formed therein with pores of a diameter suitable for permitting oil to permeate the plate by capillary action, said fuel vaporization promoting plate being placed on the bottom of said vaporizer pot in a manner to cover the entire area thereof and having at least one upwardly directed inclined portion formed, by continuously raising away from the surface of the bottom of the vaporizer pot, a portion of said plate which covers a marginal portion of the bottom of said pot;

an oil feeding device including an oil feed pipe opening on the surface of the bottom of said vaporizer pot on which said fuel vaporization promoting plate is located, said oil feeding device being capable of controlling the quantity of oil supplied through said oil feed pipe;

an oil diffusing device including at least one oil diffusing passage formed in a space defined between said at least one upwardly directed inclined portion of said fuel vapor-

ization promoting plate and the surface of the bottom of said vaporizer pot for causing oil to flow therethrough by natural flow action to the marginal portion of the bottom of said vaporizer pot, said oil feed pipe having a forward end disposed on said passage so as to cause the oil to be diffused to the entire area of said fuel vaporization promoting plate by utilizing said passage; and

a primary combustion air supply device for supplying a space above said fuel vaporization promoting plate with primary air of combustion;

wherein the surfaces of said pores formed in said fuel vaporization promoting plate function as surface means for vaporizing the oil and receiving the heat of radiation generated by flames.

4,133,633

COMBUSTION CHAMBER FOR GAS TURBINE ENGINES

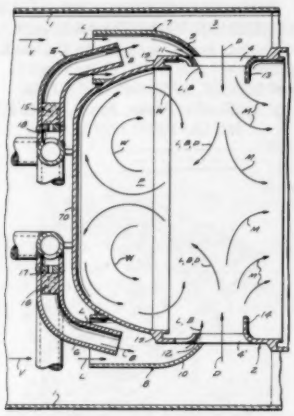
Adolf Fehler, Pfaffing; Günter Kappler, Freising; Günter Kirschey, and Jost Schmidt, both of Munich, all of Fed. Rep. of Germany, assignors to Motoren-und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Feb. 22, 1977, Ser. No. 770,976

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1976, 2606704

Int. Cl.² F23D *15/02*; F02C *7/22*

U.S. Cl. 431—352 **14 Claims**



1. A combustion chamber for a gas turbine engine having an air compressor, comprising:

(a) an outer casing,

(b) a flame tube within said casing defining an annular space between said tube and casing, said space receiving air from the engine compressor, said flame tube having a back wall at its upstream end,

(c) a plurality of diametrically opposed pairs of air inlet ports in said flame tube near its upstream end through which air from said annular space is introduced generally radially inwardly into said flame tube.

(d) a separate flow guide associated with each air inlet port, said flow guides being carried on the exterior surface of said flame tube, each flow guide extending generally in the longitudinal direction of the combustion chamber, the upstream end of each flow guide being open to air from the engine compressor and the downstream end of each guide extending toward the longitudinal centerline of the combustion chamber and partitioning the upstream portion of its respective air inlet port from said annular space, and

(e) a separate fuel tube for introducing fuel into each of said flow guides, the outlet of each fuel tube being downstream from the back wall of said flame tube but upstream from its respective air inlet port, and the outlet of each fuel tube being arranged to direct fuel toward the inner surface of its respective flow guide.

4,133,634

STEEL STRIP PREHEATING METHOD

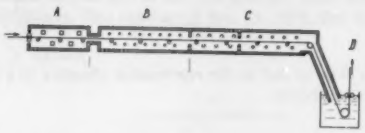
Robert Wang, Wissous, France, assignor to Heurtey Metallurgie, Paris, France

Filed Jul. 1, 1977, Ser. No. 812,333

Claims priority, application France, Jul. 5, 1976, 76 20346

Int. Cl.² F27D *7/06, 23/02*

U.S. Cl. 432—2 **3 Claims**



1. In a process for galvanizing steel strips in a galvanizing production line, said process including the step of preheating said steel strips to clean said steel strips, the improvement wherein said preheating step comprises:

introducing said steel strips into a non-oxidizing oven; and

heating said oven, and thereby said steel strips, by burning a liquid emulsion of liquid fuel and water within said oven such that the temperature of the atmosphere within said oven is from 900° C. to 1500° C.

4,133,635

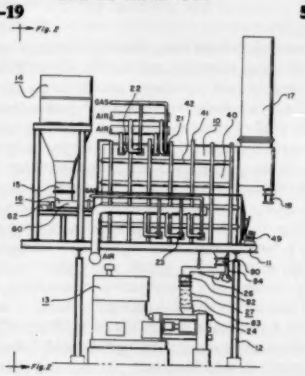
METHOD AND APPARATUS FOR DRYING AND PREHEATING SMALL METALLIC PARTICLES

John R. Fellnor, Burlington, N.J., and William J. Love, Jr., Perkasie, Pa., assignors to Combustion Engineering, Inc., Stamford, Conn.

Filed Feb. 7, 1977, Ser. No. 766,489

Int. Cl.² F27D *7/00*

U.S. Cl. 432—19 **57 Claims**



15. The method for drying and preheating small metallic particles such as chips, turnings, borings and the like to remove volatiles therefrom such as moisture and combustibles such as cutting oils comprising the steps of:

passing the particles through a conveyor positioned within a stationary drying and preliminary combustion chamber;

heating the particles to at least a temperature at which the volatiles will be driven from the particles; and

restricting the presence of oxygen from the particles in the region in which they are heated to reduce oxidation thereof.

4,133,636

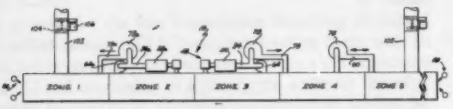
TENTOR

Charles S. Flynn, Muskegon, Mich., assignor to Blu-Surf, Inc., Muskegon, Mich.

Filed Jun. 30, 1977, Ser. No. 811,583

Int. Cl.[2] F23J *5/00*

U.S. Cl. 432—72 **11 Claims**



1. A multiple zone oven apparatus for heating web stock to drive off volatilizable, combustible materials, comprising:

a plurality of oven zones including an entry zone for pre-heating web stock, an exit zone, and one or more intermediate zones for volatilizing material from web stock, all having passage means for conveyance of web stock therethrough;

gaseous outlet means into said oven for gases at elevated volatilizing temperatures;

gaseous incineration and recycle means including burner means for combusting volatilized material and increasing the temperature thereof to incineration temperatures; duct means from said intermediate zones of said oven to said burner means to conduct material laden gases from said intermediate zones of said oven to said burner means for incineration; second duct means from said burner means back to said oven through said gaseous outlet means, and arranged for conducting at least part of the recycled gases back to said entry zone; and cool air inlet means in said second duct means to lower the elevated temperatures of the gases from incineration temperatures to volatilizing temperatures before re-entry into said oven.

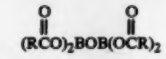
4,133,637

OXYBIS(DIACYLOXYBORANES) AS PEROXYGEN ACTIVATORS

John H. Blumbergs, Highland Park, and Fred R. Scholer, Cranbury, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Oct. 3, 1977, Ser. No. 838,850
Int. Cl.[2] D06L 3/00
U.S. Cl. 8—107 15 Claims

1. A process for the low temperature bleaching of stained and/or soiled fabrics which comprises treating them with an aqueous peroxygen bleaching solution having a pH of about 6 to about 12 and containing as a peroxygen activator therefor, an effective amount of an oxybis(diacyloxyborane) having the formula:



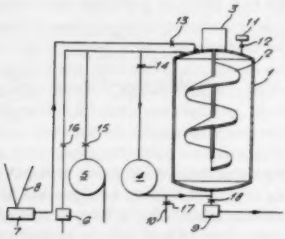
wherein the acyloxy is derived from a carboxylic acid selected from the class consisting of saturated aliphatic carboxylic acids of 1 to 18 carbon atoms and aromatic carboxylic acids of the benzene and naphthalene series.

4,133,638

METHOD OF STERILIZING POWDERS IN A FLUIDIZED BED

Dennis R. Healey, Loughborough, England, assignor to The Boots Company Limited, Nottingham, England

Filed Nov. 15, 1976, Ser. No. 742,162
Claims priority, application United Kingdom, Nov. 14, 1975, 46973/75
Int. Cl.[2] A61L 1/00, 13/00
U.S. Cl. 422—32 3 Claims



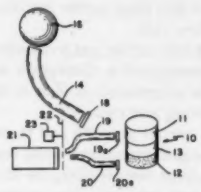
1. A method of sterilizing a powder in a sterilizing vessel which comprises passing a stream of gas or vapour, comprising a sterilant, through the powder whilst stirring the powder with a mechanical stirrer, circulating said sterilant, the combination of the passage of the sterilant and the stirring being sufficient to maintain the powder in a fluidized state, and wherein the amount of sterilant employed is less than that required to fluidize the powder in the absence of stirring, the total energy required to pass the sterilant through the powder and to stir the powder is less than that required if fluidization is carried out utilizing the sterilant alone or stirring alone, and greater than one third of the vessel is initially filled with said powder.

4,133,639

TEST ARTICLE INCLUDING A COVALENTLY ATTACHED DIAGNOSTIC REAGENT AND METHOD

Richard A. Harte, Redwood City, Calif., assignor to International Diagnostic Technology, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 553,582, Feb. 27, 1975, Pat. No. 3,992,631, which is a continuation-in-part of Ser. No. 447,574, Mar. 17, 1974, abandoned. This application Mar. 4, 1976, Ser. No. 663,828
Int. Cl.[2] G01N 33/16, 21/00
U.S. Cl. 23—230 B 13 Claims



1. A body suitable for use in the fluorometric detection of a biologically derived sample, said body comprising handle means connected to at least one nonparticulate, nonswellable, impermeable, continuous, flat surface region defining an area of at least one square millimeter and a diagnostic reagent bound to at least one biologically derived sample labelled with a fluorochrome, said diagnostic reagent being covalently attached to said surface region.

7. In a method for the fluorometric detection of an unknown quantity of a biologically derived sample, the steps of:

(a) covalently attaching a diagnostic reagent to at least one nonparticulate, nonswellable, impermeable continuous, flat surface region of a body,

(b) contacting the reagent-bonded flat surface of step (a) with a sample substance reactive with said diagnostic reagent in solution and with a fluorochrome labelled substance in solution for a sufficient time to form a fluorochrome labelled reaction product capable of detection,

(c) separating the reacted surface and solution containing unbound fluorochrome labelled substance after completion of step (b),

(d) washing the reacted surface of step (c); and

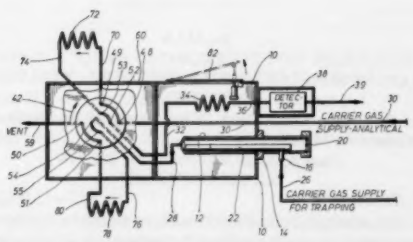
(e) transporting the body to the detection station of a fluorometer to quantitatively measure the amount of fluorescence emitted from the washed reacted surface of step (d).

4,133,640

CHROMATOGRAPHIC ANALYSIS APPARATUS

Russell M. Clinton, Houston; A. Allilee Taylor, Mont Belvieu, and Jimmy W. Brown, Dayton, all of Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Feb. 16, 1978, Ser. No. 878,500
Int. Cl.[2] G01N 25/02, 31/08
U.S. Cl. 23—230 PC 9 Claims



5. A method for chromatographically analyzing a plurality of samples having volatile components present in a non-

volatile matrix by a process carried out in two repetitive, alternating operating cycles, said process consisting essentially of;

in the first cycle;

(a) Introducing a weighed sample into a heating cylinder positioned in an oven heated to a preselected lower temperature,

(b) Increasing the oven temperature to a preselected higher temperature and then maintaining its temperature at said preselected higher temperature for the duration of said cycle.

(c) Introducing a first inert carrier gas into said cylinder at a preselected flow rate;

(d) Feeding said first carrier gas from said cylinder to a first packed chromatographic absorption trap column while maintaining its temperature at least as high as its temperature upon leaving said cylinder,

(e) Passing said carrier gas into and through said first trap column and to the atmosphere while maintaining said trap column at ambient temperature; the direction of gas flow through said trap column being reversed from the direction of flow in the immediately preceding operating cycle,

(f) Rapidly heating a second packed chromatographic absorption trap column to a temperature at least as high as the higher preselected temperature of the oven and then terminating said heating,

(g) Feeding a second heated carrier gas at a preselected rate into and through said second trap column and to the inlet of a chromatographic analysis column positioned in said oven, the direction of gas flow through said trap column being reversed from the direction of flow in the immediately preceding operating cycle,

(h) Feeding the outlet gas of the analysis column to a detector which analyzes said output gas and generates signals indicative of its chemical composition, and

(j) Cooling said oven to its lower preselected temperature at the end of the cycle and removing the sample from the sample cylinder,

in the second cycle;

(k) Repeating each of steps (a) to (j) with the following modifications:

(i) heating the first trap column in lieu of the second trap column,

(ii) maintaining the second trap column at ambient temperature,

(iii) passing the first carrier gas through the second trap column,

(iv) passing the second carrier gas through the first trap column.

4,133,641

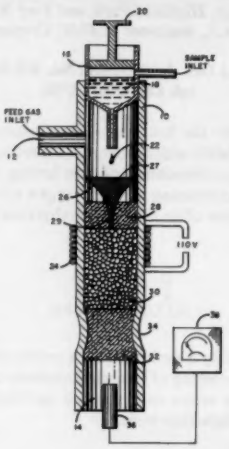
COMBUSTION CONE FOR CHEMICAL ANALYSIS INSTRUMENT

Dale E. Lueck, Chelmsford, Mass., assignor to Ionics Inc., Watertown, Mass.

Filed Apr. 12, 1978, Ser. No. 895,426
Int. Cl.[2] G01N *25/24*
U.S. Cl. 422—78 **8 Claims**

1. In a chemical combustion analysis instrument wherein a liquid sample drop is volatilized in the presence of a carrier gas for reaction with said gas within a heated catalyst bed, the improvement which comprises:

A combustion cone of high thermal conductivity positioned to receive said liquid sample drop at the frustum of said cone and to eject said sample in a volatilized state at the



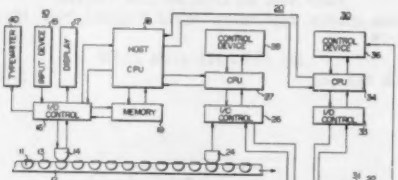
apex of said cone, said apex positioned in close proximity to said catalyst bed.

4,133,642

PIPETTING APPARATUS FOR AUTOMATIC ANALYZER

Shozo Nosaka, Tokyo, and Masahiro Yamamoto, Fuji, both of Japan, assignors to Terumo Corporation, Tokyo, Japan

Filed Mar. 10, 1978, Ser. No. 885,120
Int. Cl.[2] G01N *33/16, 1/14*
U.S. Cl. 422—67 **5 Claims**



1. A pipetting apparatus for automatic analyzer, comprising: a sample supply container holding a sample and provided with a recording medium; a means for writing sample information in said recording medium of said sample supply container and reading the written sample information; a first confirmation means for confirming the identity of the written information with the read information; a sample receptacle with a recording medium being conveyed so as to face said sample supply container storing said sample information; a means for reading the sample information recorded in said recording medium of said sample supply container and recording the read sample information in said recording medium of said sample receptacle; a second confirmation means for confirming the identity of the sample information recorded in said recording medium of said sample receptacle with the sample information recorded in said recording medium of said supply container; and a pipetting control unit for pipetting in response to the identical information from said second confirmation means.

4,133,643

METHOD AND APPARATUS FOR DECOMPOSING AMMONIA FUMES HAVING A HIGH HYDROGEN SULFIDE CONTENT

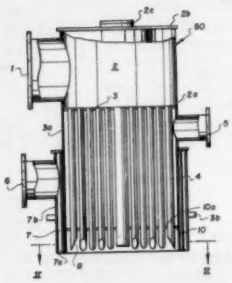
Gustav Choulat, Recklinghausen; Kurt Lorenz, Hattingen, and Egon Petsch, Recklinghausen, all of Germany, assignors to Firma Carl Still Recklinghausen, Germany

Division of Ser. No. 789,682, Apr. 21, 1977. This application Oct. 27, 1977, Ser. No. 845,937

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1976, 2618027

Int. Cl.² B01J 1/00

U.S. Cl. 422—182 1 Claim



1. A burner for decomposing ammonia fumes having a high hydrogen sulfide content, particularly deacidizer fumes from a closed-circuit scrubber of coke oven gases, comprising a cylindrical housing having a closed end wall and and an opposite opened end, a cylindrical tube sheet in said housing spaced from said closed end and defining an air chamber portion between said tube sheet and said closed end, a plurality of air passage hollow tubes extending through said tube sheet and having passages therethrough for combustion air from said air chamber, said tubes having ends opposite said tube sheet ends for the discharge of the combustion air, means defining a coke oven gas chamber between said tubes, an inlet for coke gases connected into said coke oven gas chamber, means defining a plurality of coke oven gas discharges adjacent said combustion air discharges from said combustion air tubes, and means defining a separate annular passage for the ammonia fumes extending around said housing and having an annular ammonia fume discharge in the vicinity of said combustion air tubes and said coke oven gas discharges whereby the coke oven gases and air ignite to form a central flame which is surrounded by the ammonia fumes, said air tubes being arranged in a plurality of circular rows in said tube sheet, said coke oven discharge comprising tubular openings between said rows, each of said combustion air tubes terminating in a beveled end discharge, said bevelled ends of said air tubes oriented so that the bevels direct the air inwardly in the outermost circular row of said tubes, and the tubes in the rows inwardly from the outermost row of said tube having their bevels oriented to direct air flow in circumferential directions which alternate in opposite directions from row to row inwardly, whereby most of the oxygen in the combustion air is reacted with the coke oven gas in the central flame before the surrounding ammonia fumes are heated and admixed with the central flame.

4,133,644

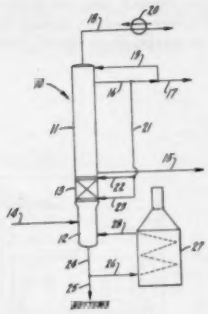
CATALYTIC REACTOR-FRACTIONATOR APPARATUS

Richard L. Holloway, Country Club Hills; Robert R. Edison, Olympia Fields, and Stephen J. Wachtel, Homewood, all of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Division of Ser. No. 578,790, May 19, 1975, Pat. No. 4,033,861. This application Jan. 25, 1977, Ser. No. 762,600

Int. Cl.² B01J 8/02

U.S. Cl. 422—138 5 Claims



1. A reactor-fractionation column for producing a hydrocarbon material having a reduced nitrogen content from a nitrogen-containing hydrocarbon feedstock comprising:

a. an upper rectification section including at least one equilibrium stage of separation according to boiling point wherein at least one lower boiling product having a reduced nitrogen content relative to said feedstock is purified;

b. at least one outlet means in fluid communication with said first section for withdrawing said lower boiling product;

c. a lower rectification section from which at least one higher boiling product enriched in nitrogen content relative to said feedstock is withdrawn, said second section including reboiler means to provide at least a portion of the heat for said purification;

d. at least one bottoms outlet means in fluid communication with said lower rectification section for withdrawal of said higher boiling product;

e. at least one feedstock inlet means in fluid communication with said lower rectification section; and

f. at least one catalytic reaction section containing a catalyst bed between and in communication with said upper and lower sections wherein at least a portion of said feedstock is contacted in the presence of said catalyst effective to promote the polymerization of at least a portion of the nitrogen-containing compounds in said feedstock at conditions sufficient to polymerize at least a portion of said nitrogen-containing compounds.

4,133,645

VAPOR/LIQUID DISTRIBUTOR FOR FIXED-BED CATALYTIC REACTION CHAMBERS

Norman H. Scott, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 848,700, Nov. 4, 1977. This application May 4, 1978, Ser. No. 902,659

Int. Cl.² B01J 8/04

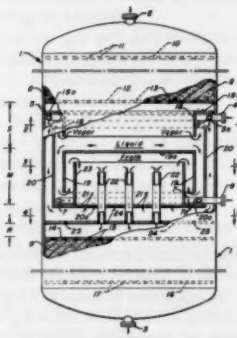
U.S. Cl. 422—220 7 Claims

1. A vapor/liquid distributor for effecting uniform distribution of a mixed-phase reactant stream to the upper surface of a fixed-bed of catalyst particles disposed within a catalytic reaction chamber, said distributor having three annular-form catalyst-free volumes defined by the interior surface of said cham-

ber and three cylindrical walls in concentric relationship therewith, and comprising, in cooperative relationship:

(a) a first cylindrical wall having (i) a greater nominal diameter and height than second and third cylindrical walls and, (ii) a perforated first horizontal plate attached to the entire lower periphery thereof, said first cylindrical wall defining an outer first annular-form volume with the interior surface of said reaction chamber;

(b) a second cylindrical wall having (i) a greater nominal diameter than the third of said cylindrical walls and, (ii) an imperforate second horizontal plate attached to the entire upper periphery thereof, and being disposed intermediate the upper and lower periphery of said first cylindrical wall and defining an intermediate second annular-form volume therewith;



(c) a third cylindrical wall disposed a finite distance below said imperforate second horizontal plate and having its entire lower periphery attached to said perforated first horizontal plate, said third cylindrical wall defining an inner third annular-form volume with said second cylindrical wall; and,

(d) a third horizontal plate, attached at its outer periphery to the interior surface of said chamber, and having a plurality of vertical tubular conduits attached to its upper surface, said tubular conduits (i) extending upwardly through said perforated first horizontal plate and within said third cylindrical wall, and terminating a finite distance below said imperforated second horizontal plate, and, (ii) having a nominal diameter greater than the remaining apertures in said perforated first horizontal plate.

4,133,646

PHENOLIC RECYCLE SOLVENT IN TWO-STAGE COAL LIQUEFACTION PROCESS

Malvina Farcasiu, Princeton; Thomas O. Mitchell, Trenton, and Darrell Duayne Whitehurst, Titusville, all of N.J., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jun. 29, 1977, Ser. No. 811,113

Int. Cl.[2] C10L *9/10;* **C10G** *11/04, 11/06;* **C10B** *57/00*

U.S. Cl. 44—1 R **20 Claims**

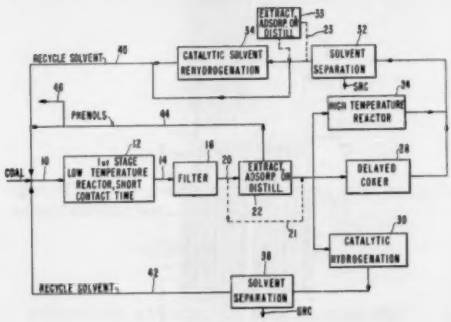
1. In a method for producing clean low sulfur fuel products from solubilized coal, wherein coal is solubilized at conditions at minimize hydrogen consumption and sulfur and ash are removed which method requires solubilizing, in a first stage, the coal in a hydrogen donor solvent material by contacting coal particles with said hydrogen donor solvent containing from 3 to about 50 weight percent phenolics at a temperature in the range of about 600°–850° F, for a time in the range of about 1 to 5 min., wherein the contact time varies inversely with temperature, and with a solvent-coal weight ratio of about 0.5–10:1; separating inorganic sulfur, ash and coal solids from the solubilized coal effluent from said first stage; upgrading in a second stage by treatment of the substantially solids free effluent from said first stage at a temperature in the range of about 600° to 1,000° F to produce a clean low sulfur fuel solubilized coal product; and separating at least a portion of said solvent material from said second stage product;

the improvement which comprises removing at least a major portion of the phenolics present in said first stage effluent prior to said upgrading in said second stage.

2. The method of claim 1 wherein at least a portion of the solvent material recovered from the second stage is recycled to the first stage.

3. The method of claim 2 wherein the sequence of steps comprises:

(a) solubilizing, in a first stage, the coal is a hydrogen donor solvent material at a temperature in the range of about 700° to about 850° F. for a time in the range of about 1 to 5 min., said time varying inversely with temperature, and selected to minimize hydrogen consumption from the said



solvent material and both hydrogen loss and aromatization of the solubilized coal to form a solubilized coal product in the first stage; wherein said hydrogen donor solvent material has from about 3 to 50 weight percent of phenolics;

(b) separating inorganic sulfur, ash and unconverted coal solids from the mixture of solvent material and coal product of the first stage;

(c) separating out a major portion of the phenolics present in a solvent material, boiling in the range of up to 850° F.;

(d) subjecting the solubilized coal, in a second stage, to temperature conditions within the range of 600° to 1,000° F. for a residence time sufficient to upgrade the said solubilized coal product and produce a low sulfur clean fuel product, and

(e) separating at least a portion of the said solvent material from the said solubilized coal product.

4,133,647

METHOD FOR PELLETIZING CARBONACEOUS SOLIDS

Francis P. Burke, Bethel Park, Pa., assignor to Continental Oil Co., Stamford, Conn. and The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 22, 1977, Ser. No. 835,627

Int. Cl.[2] C10L *5/14, 9/00*

U.S. Cl. 44—24 **10 Claims**

1. In a method for agglomerating finely divided carbonaceous solids by mixing said solids with a binder in an aqueous medium the improvement comprising mixing said solids with said binder at a temperature above about 120° C. at a pressure greater than about 1000 mm Hg, said binder consisting essentially of an oil having a softening point above about 100° C.

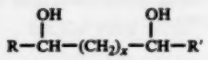
4,133,648

ORGANIC SYNERGISTS FOR ORGANO-CERIUM (IV) ANTI-KNOCK ADDITIVES IN LEAD-FREE FUEL COMPOSITIONS

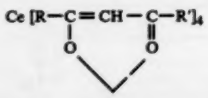
John F. Deffner, Glenshaw, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jun. 29, 1977, Ser. No. 811,074
Int. Cl.[2] C10L *1/30*
U.S. Cl. 44—68 14 Claims

1. A lead-free fuel composition having improved anti-knock and octane characteristics which comprises a liquid hydrocarbon fuel containing an anti-knock and octane improvement amount of an alkanediol of the formula:



wherein R and R′ can be either alike or different, selected from hydrogen or a hydrocarbon radical having from about 1 to about 12 carbon atoms; and x is an integer of from about 1 to about 5; in combination with an organo-cerium (IV) chelate of the formula:



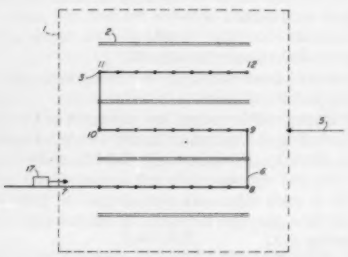
wherein R and R′ can be either alike or different members selected from the group consisting of hydrogen or hydrocarbon radicals including alkyl aryl, aralkyl, alkaryl and cycloalkyl radicals containing from about 1 to about 12 carbon atoms with the sum of the carbon atoms in said radicals being from about 3 to about 24.

4,133,649

REDUCED POWER INPUT FOR IMPROVED ELECTROSTATIC PRECIPITATION SYSTEMS

Helmut I. Milde, Andover, Mass., assignor to High Voltage Engineering Corporation, Burlington, Mass.

Continuation of Ser. No. 609,708, Sep. 2, 1975, abandoned, which is a continuation-in-part of Ser. No. 422,401, Dec. 6, 1973, abandoned. This application Aug. 2, 1977, Ser. No. 821,084
Int. Cl.[2] B03C *3/00*
U.S. Cl. 55—2 3 Claims



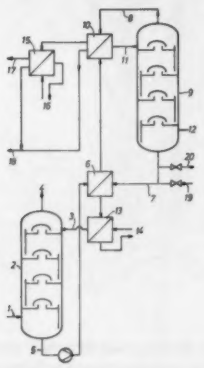
1. A method of pulse-charging the electrode system of an electrostatic precipitator, said electrode system comprising corona electrodes interconnected by electric conductors to form a corona electrode system and collector electrodes interconnected by electric conductors to form a collector electrode system, said collector electrode system and said corona electrode system being juxtaposed so as to form the electrode system capable of producing corona at said corona electrodes when a voltage applied across said electrode system is at a corona-producing level, which method comprises raising the voltage across only a portion of said electrode system to a corona-producing level so that the voltage across said portion returns to a non-corona producing level before said raised voltage has reached the remainder of said electrode system.

4,133,650

REMOVING SULFUR DIOXIDE FROM EXHAUST AIR

Rolf Germerdonk, Bergisch-Gladbach, and Adam Jonas, Leichlingen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 9, 1977, Ser. No. 795,334
Claims priority, application Fed. Rep. of Germany, May 28, 1976, 2623963; Jan. 22, 1977, 2702583
Int. Cl.[2] B01D *19/00*
U.S. Cl. 55—49 2 Claims



1. In the process for removing SO_2 from waste air or exhaust gases to a concentration of less than about 0.1% by volume by absorption in a buffered, aqueous solution of an organic acid, followed by regeneration of the absorption solution by thermal treatment, the improvement which comprises

(a) effecting the absorption by scrubbing in at least one scrubber at a temperature of about 20° to 25° C. with an aqueous solution of undistilled glutaric acid which is a mixture of glutaric, adipic and succinic acids which has a concentration of from about 40 to 90% of the saturation concentration and buffered to a pH of about 3.5–6.5,

(b) heating the scrubbing solution to a temperature between about 50° C. and the boiling point of the scrubbing solution, thereby to remove the dissolved SO_2 and regenerate the solution, and

(c) cooling the scrubbing solution thus regenerated to a temperature of about 20° to 25° C. prior to recycling for the absorption of more sulfur dioxide.

4,133,651

METHODS FOR REMOVING RADIOACTIVE ISOTOPES FROM CONTAMINATED STREAMS

David R. Hoy, Grove City; Thomas N. Hickey, Worthington; Ivars S. Spulgis, Columbus, and Harold C. Parish, Dublin, all of Ohio, assignors to CVI Corporation, Hilliard, Ohio

Continuation-in-part of Ser. No. 640,108, Dec. 11, 1975. This application Apr. 16, 1976, Ser. No. 677,581
Int. Cl.[2] B01D *53/02*
U.S. Cl. 55—75 18 Claims

1. A method for removing radioactive isotopes from a contaminated gas stream comprising the steps of:

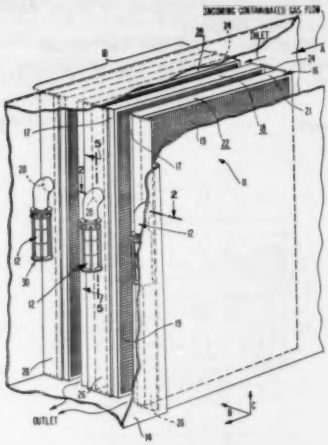
(a) feeding the entire gas stream through a closed duct;

(b) dividing said stream along vertical lines into a plurality of horizontally flowing substreams;

(c) forcing at least a major portion of each substream horizontally through free-standing uncompressed particulate granular adsorbent material contained in a vertically upstanding adsorbent bed within said duct wherein radioac-

tive isotopes are adsorbed, to a position downstream of a sample canister;

(d) diverting a minor portion of at least one horizontally flowing substream from the substream major portion, prior to substream flow through said vertically upstanding adsorbent bed, into a curvilinear conduit for changing direction of flow of said minor portion from horizontal to vertical;



(e) vertically flowing said diverted minor portion through a free-standing uncompressed column of sample particulate granular adsorbent material contained in a sample canister, wherein radioactive contaminants are adsorbed from said diverted minor portion, to a position downstream said vertically upstanding bed;

(f) combining said major portions and said minor portions of all said streams into a single stream;

wherein all gas flow through adsorbent material in a sample canister is vertical.

4,133,652

ELECTRONIC AIR CONDITIONER

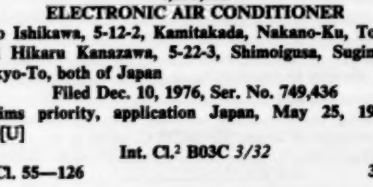
Makio Ishikawa, 5-12-2, Kamitakada, Nakano-Ku, Tokyo-To, and Hikaru Kanazawa, 5-22-3, Shimoigusa, Suginami-Ku, Tokyo-To, both of Japan

Filed Dec. 10, 1976, Ser. No. 749,436

Claims priority, application Japan, May 25, 1976, 51-66900[U]

Int. Cl.[2] B03C *3/32*

U.S. Cl. 55—126 **3 Claims**



1. An electronic air conditioner comprising:

an insulated casing having an air inlet and an air outlet;

a mechanical filter provided at the air inlet in said casing;

a charging section, electrostatic dust collecting section, ozone reducing section and a negative ion generating section, arranged in this order between the mechanical filter and the air outlet of said casing;

a high voltage source and connecting means for connecting said high voltage source to apply a negative high voltage to each of said charging section, said electrostatic dust collecting section and said negative ion generating section;

a fan located at a position between said air inlet and air outlet of said casing in order to cause a flow of air from the air inlet to the air outlet;

a heat exchanger placed between said ozone reducing section and negative ion generating section for exchanging heat with the flow of air in the casing, and said heat exchanger including means for extracting heat from air flowing through said casing; and

an electrically non-conductive diffuser positioned at the air outlet of said casing downstream from said negative ion generating section.

4,133,653

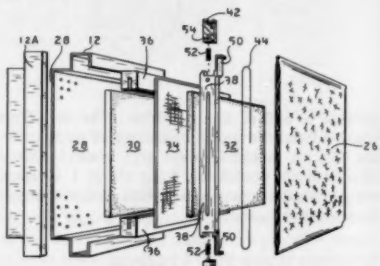
AIR FILTRATION ASSEMBLY

Charles W. Soltis, Houston, Tex., assignor to Filterlab Corporation a subsidiary of Masco Corporation, Houston, Tex.

Filed Aug. 1, 1977, Ser. No. 820,639

Int. Cl.[2] B03C *3/32*

U.S. Cl. 55—126 **14 Claims**



1. An air filtration assembly, which comprises;

(a) a support frame defining the periphery of an air-flow chamber which is open at first and second ends;

(b) an air-permeable collector unit mounted within said chamber, closing the first end, said unit comprising,

(i) a first web of a dielectric filter;

(ii) a second web of a dielectric filter;

(iii) electrode means comprising an electrical conducting grid sandwiched between the first and second webs;

(iv) means connected to said grid for applying a positive electrical charge thereto; and

(v) means for electrically insulating said unit from the support frame;

(c) an air-permeable ionizer unit mounted within said chamber, closing the second end, said ionizer unit comprising,

(i) a plurality of substantially flat blades having flat surfaces and opposed ends and positioned generally parallel to each other and spaced apart to form interposed air-flow passages between the second end and the collector unit;

(ii) a plurality of insulator members with an individual insulator member on each end of each of said blades, resilient mounting means resiliently mounting each insulator member on each end of said blades so as to be resiliently movable along their length, said insulator members having a surface portion raised above said flat surface of said blades;

(iii) a continuous length of electrical conducting wire mounted on each insulator member and stretched and threaded in a serpentine pattern on and between the insulator members on each blade end, said wire being spaced above said flat surface of the blade, said resilient

mounting means being operable to maintain a taut condition of the wire between each insulator member; and

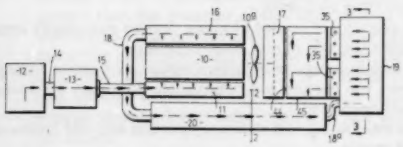
(iv) means connected to said wire and said blades for applying a positive electrical charge to the wire and a negative charge to the blades.

4,133,654

APPARATUS FOR TREATING EXHAUST GAS

John M. Hill, Nottingham, and Brian R. Garnish, Loughborough, both of England, assignors to Becorit (G.B.) Limited, Nottingham, England

Filed Dec. 13, 1976, Ser. No. 749,808
Claims priority, application United Kingdom, Jan. 31, 1976, 3882/76
Int. Cl.² B01D *47/02*
U.S. Cl. 55—222 3 Claims



1. In apparatus for treating exhaust gas from an internal combustion engine comprising an exhaust pipe having a jacket for the flow of cooling liquid therethrough and a conditioner chamber for receiving exhaust gas from said pipe, the improvement wherein the conditioner chamber comprises:

a. an outer casing having a water jacket defined between an inner wall and an outer wall of said casing for circulation through said jacket of cooling water, said casing including a lower portion containing a bath of gas conditioning liquid and an upper portion having an exhaust gas inlet, connected to said pipe, and having an exhaust gas outlet,

b. duct means defining a flow path internally of said casing from said inlet through at least a portion of the surface of said liquid bath extending to a position adjacent to the lower end of said casing, said duct means being connected to said inner wall of said water jacket,

c. means in the lower portion of said casing and immersed in said bath for causing bubbles of the exhaust gas to form at horizontally distributed positions and travel upwardly through said bath from said position to the surface of said bath,

d. condensing means in the upper portion of said casing for contacting exhaust gas leaving the surface of said bath in the flow of said exhaust gas towards said outlet, said condensing means defining a plurality of flow paths in parallel with each other and having surfaces for drip-back of condensed liquid to said path, and being connected to said inner wall for heat extraction from said condensing means to said water in said water jacket.

4,133,655

SCRUBBER FOR BLAST FURNACE GAS

Roberto R. De Cardenas, Milan, Italy, assignor to De Cardenas S.p.A., Milan, Italy

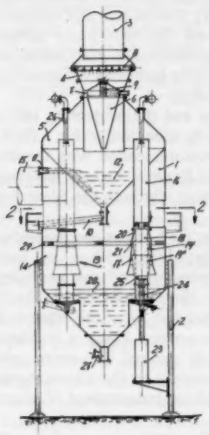
Filed Feb. 15, 1977, Ser. No. 768,880
Claims priority, application Italy, Feb. 25, 1976, 20568 A/76
Int. Cl.² B01D *47/10*
U.S. Cl. 55—223 12 Claims

1. A scrubber for blast furnace gas, comprising:

a first gas purifying unit for effecting primary purification of the gas and having means connectable to the furnace for receiving the gas, spray means for discharging a scrubbing fluid into said purifying unit, and a primary venturi coupled to said receiving means and having an annular gas flow passage of substantially constant cross-sectional area;

a first separation chamber in fluid communication with said primary venturi for receiving the gas from said primary venturi;

an assembly in fluid communication with said first separating chamber for effecting final gas purification and adjustment of the blast furnace gas pressure, said assembly being disposed in series with said first purifying unit and positioned within a second separation chamber, said assembly



comprising a multi-stage venturi receiving gas from said first separation chamber, said multi-stage venturi including a first stage having an annular gas flow passage of substantially constant cross-sectional area and a second stage in series with said first stage and having means defining an annular gas flow passage of variable cross-sectional area;

second spray means for introducing a scrubbing fluid into said assembly; and

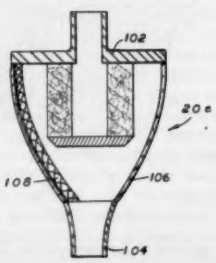
gas outlet means connected to said second separation chamber.

4,133,656

BACTERIA FILTERS WITH TRANSPARENT HOUSINGS

Edward A. Kippel, Suffern, N.Y., and Paul O. Huston, Montville, N.J., assignors to Becton, Dickinson and Company, East Rutherford, N.J.

Division of Ser. No. 669,622, Mar. 23, 1976, abandoned. This application Feb. 2, 1977, Ser. No. 765,111
Int. Cl.² B01D *46/00*
U.S. Cl. 55—274 1 Claim



1. A bacteria filter for use in anesthesiology and resporatory

air systems to filter fluid flow at a desired point in a system comprising:

an enlarged electrically non-conductive, transparent tubular housing having a passageway therethrough and having at one end a reduced tip;

an electrically conductive connector mounted to the reduced tip;

an electrically conductive end cap affixed to the end of the housing distal from the reduced tip;

the end cap having an opening therethrough terminating in a projecting end cap connector;

a filter element mounted in the housing;

an electrically conductive portion extending between the end cap and the electrically conductive connector to provide an electrically conductive pathway from end to end of the filter including the space occupied by the transparent housing;

the connector and the projecting end cap connector being adapted to be mounted within a fluid flow system to permit fluid communication with the interior of the housing so that fluid flowing through the system passes in one end of the housing, through the filter element and out of the other end;

the connector, the housing and the end cap being arranged in a series relationship with means between the connector and the projecting end cap providing a fluid flow from said system through one end of the housing, through the filter element and out of the other end and the electrically conductive portion being a conductive strip extending from end to end of the series relationship and being mounted entirely on the interconnected housing, connector, and end cap independent of external supporting structure; and

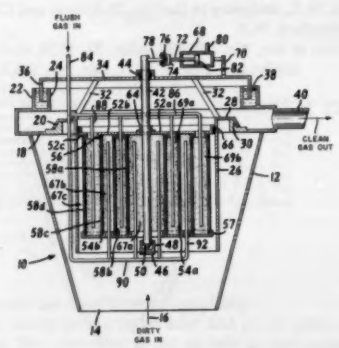
the electrically conductive portion extending between the end cap and the electrically conductive connector being a conductive strip on the transparent interior surface of the housing, the strip covering a minimal portion of the circumferential area of the tubular housing so as to provide minimum interference with the visual observation of the interior of the housing while providing for an electrically conductive pathway from end to end of the filter.

4,133,657

APPARATUS FOR PURIFICATION OF GASSES

Harald Krogsrud, Gjettum, Norway, assignor to Elkem-Spigerverket A/S, Oslo, Norway

Filed Mar. 15, 1977, Ser. No. 777,579
Claims priority, application Norway, Mar. 17, 1976, 760930
Int. Cl.[2] B01D *46/04*
U.S. Cl. 55—290 **11 Claims**



1. A filter apparatus for continuous filtering of gasses containing particulate matter comprising:

(a) a housing;

(b) a cylindrical filter assembly within said housing;

(c) inlet means in said housing for admitting gas to said filter assembly;

(d) outlet means in said housing for exiting gas from said filter assembly;

(e) said filter assembly including a plurality of permeable self-supporting filter cylinders within said filter assembly;

(f) said filter cylinders having substantially different diameters and substantially equal lengths;

(g) said filter cylinders being nested coaxially creating annular chambers therebetween;

(h) means for blocking the entry of gas into alternate chambers;

(i) means for blocking the exit of gas from the other said annular chambers;

(j) seal means for blocking the passage of gas from inlet means to outlet means through the innermost of said filter cylinders;

(k) seal means for blocking the passage of gas from inlet means to outlet means past the outside of the outermost of said filter cylinders;

(l) a plurality of spaced cleaning devices stationarily located about the axis of said filter cylinders;

(m) said housing comprising a stationary portion having an open top portion and removeable lid means for covering said open top;

(n) a seal joining said stationary portion and said removeable lid means;

(o) means for suspending said filter assembly from said removeable lid means;

(p) means for rotating said filter cylinders through at least the angular separation between adjacent cleaning devices; and

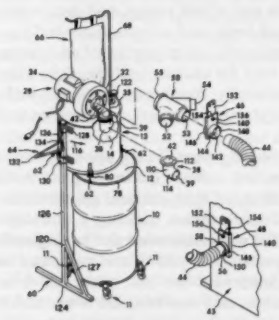
(q) said lid means and filter assembly being removeable as a unit from said stationary portion.

4,133,658

INDUSTRIAL DUST COLLECTION SYSTEM AND APPARATUS

Leo R. Callewyn, 7132 Marshall, Arvada, Colo. 80003

Filed Oct. 21, 1977, Ser. No. 844,376
Int. Cl.[2] B01D *50/00*
U.S. Cl. 55—315 **15 Claims**



1. An industrial dust collection system for collecting dust created by operation of a machine comprising:

dust collecting and storage means having a cylindrical side wall portion mounted in a vertical position for collecting and storing dust generated by a machine;

cyclone chamber means mounted on the upper end of the dust collecting and storage means in a vertical position and having a cylindrical side wall portion and an annular upper end wall portion and an annular lower end wall portion and a dust inlet opening at the upper end thereof, for receiving dust laden air from the machine;

forced air fan means connected to the cyclone chamber

means for establishing a continuous induced flow of dust laden air from the machine to the fan means and for establishing a flow of dust laden air from the fan means to the cyclone chamber means;

flow direction control means connected to said forced air fan means and being mounted in the chamber means for establishing a circular and axially downward flow of dust laden air within the cyclone chamber means;

vortex chamber means mounted within the cyclone chamber means and having a vertically extending funnel shape passage located centrally and coaxially relative to said cylindrical side wall portion and an annular inlet opening of minimum diameter at the lower end of said cyclone chamber means and an annular outlet opening of maximum diameter at the upper end of said cyclone chamber means for establishing an upward flow of air therethrough in said cyclone chamber means; and

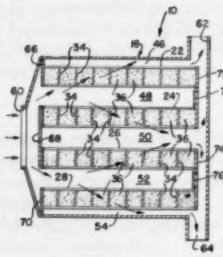
said annular lower end wall portion defining dust discharge passage means in having an annular opening of a diameter greater than the diameter of said annular inlet opening of said vortex chamber means and being axially spaced therebelow for connecting said cyclone chamber means to said dust collecting and storage means for transfer of dust from said cyclone chamber means to said dust collecting and storage means prior to entry of air into said vortex chamber means.

4,133,659

SYSTEM FOR REMOVING POLLUTANTS FROM GASES HAVING INTERNAL BYPASS CAPABILITY

Eugene B. Beckman, Rockaway, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Jan. 24, 1977, Ser. No. 762,212
Int. Cl.² B01D *46/42*
U.S. Cl. 55—314 **8 Claims**



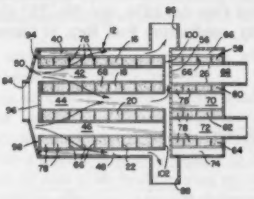
1. A system for adsorbing pollutants from gases comprising a housing having inlet means for receiving said gases and outlet means for discharging said gases, a horizontal baffle disposed in said housing and defining an upper adsorbing chamber and a lower adsorbing chamber in said housing, means within the interior of said housing for receiving a first series of beds of adsorbent activated char, said beds being formed in a plurality of vertically extending rows each extending through said upper chamber and said lower chamber, means within the interior of said housing for receiving a second series of beds of adsorbent activated char, first passage means formed within said housing for permitting passage of said gases directly from said inlet means to said outlet means, second passage means formed in said housing for permitting passage of said gases in said upper adsorbing chamber from said inlet means, across said first series of beds of activated char and to said outlet means, third passage means formed in said housing for permitting passage of said gases in said lower adsorbing chamber from said inlet means, across said first and second series of beds of activated char and to said outlet means, and damper means disposed in said housing for selectively directing said gases through said passage means.

4,133,660

ADSORBER FOR REMOVING POLLUTANTS FROM GASES HAVING UNIFORM ADSORPTION CAPABILITY

Peter Steiner, Edison, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Jan. 12, 1978, Ser. No. 869,897
Int. Cl.² B01D *39/00*
U.S. Cl. 55—387 **6 Claims**



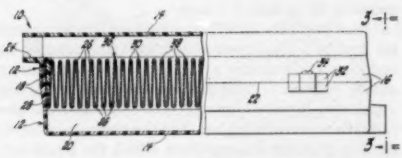
1. A system for removing pollutants from gases comprising a housing having inlet means for receiving said gases and first and second outlet means for discharging said gases, means for defining an upper chamber and a lower chamber in said housing, means in said housing for receiving a first series of beds of activated char extending through said upper chamber and said lower chamber, means in said housing for receiving a second series of additional beds of activated char in said lower chamber, means formed in said upper chamber for directing said gases from inlet means, across said first series of beds of activated char in said upper chamber and to said first outlet means, and means disposed in said lower chamber for directing said gases from said inlet means across said first series of beds of activated char in said lower chamber, across said additional series of beds of activated char in said lower chamber and to the second outlet means.

4,133,661

AIR FILTER ASSEMBLY

Ronald L. Strnad, Grand Blanc, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 25, 1977, Ser. No. 854,658
Int. Cl.² B01D *46/52*
U.S. Cl. 55—497 **3 Claims**



1. A filtering unit comprising oppositely disposed first and second housing halves, each of said housing halves including a bottom wall and oppositely disposed side and end walls forming a chamber therewithin, a flat mating surface formed along the top of each of said side and end walls, an opening formed in one end wall providing means for communicating air therethrough between the interior and the exterior of said chamber, a set of equally spaced rib segments formed adjacent the inner surface of each side wall, said rib segments extending out of said chamber a predetermined distance beyond said flat mating surface, and an end rib corresponding in cross-section to said rib segments extending laterally across one end and spaced from the adjacent end wall; said rib segments and end ribs being adapted to provide a predetermined width space between adjacent interdigitated rib segments and end ribs when said flat mating surfaces of said first and second housing halves are mounted in an abutting relationship with said openings positioned at opposite ends; a filtering sheet having a series of pleats formed thereacross confined in said space between op-

positely disposed sets of interdigitated rib segments and end ribs; and means formed on the exterior of each housing half for fastening the abutted halves together.

4,133,662

PRODUCTION OF HIGH PRESSURE OXYGEN

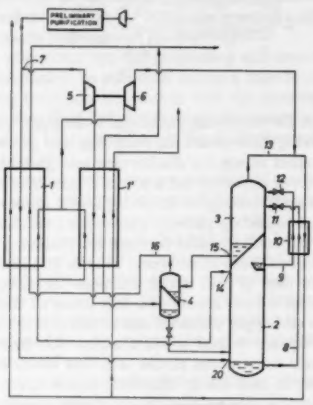
Norbert Wagner, Schlederloh, Wolfratshausen, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Dec. 16, 1976, Ser. No. 751,453

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1975, 2557453

Int. Cl.² F25J 3/04

U.S. Cl. 62—13 **11 Claims**



1. In a process for the separation of oxygen having a pressure of 1.7 to 3.6 bars from air in a two-stage low-temperature rectification column, the steps comprising:

(a) subdividing preliminary purified and compressed air having a pressure of 5.8 to 7.8 bars absolute into a minor stream constituting 18–34% of the air and a major stream constituting the remainder of the air;

(b) further compressing said minor stream of air from a pressure of 5.8 to 7.8 bars to a pressure of 6.5 to 10 bars absolute wherein said minor stream is compressed incrementally by at least 0.7 bars;

(c) at least partially liquefying resultant further compressed air feed in a condenser-evaporator functionally separate and distinct from said two-stage low-temperature rectification column in indirect heat exchange contact with vaporizing liquid oxygen product maintained at about 0.4 to 2.0 bars pressure higher than the pressure in the sump of the low pressure column from which the liquid oxygen is obtained, said oxygen vapor having a pressure of 1.7 to 3.6 bars;

(d) passing resultant at least partially liquefied air into the high pressure stage of the rectification column;

(e) cooling the major stream of the air feed without further compressing;

(f) passing resultant cooled major stream of the air feed into the high pressure stage of the rectification column;

(g) withdrawing a gaseous stream acting as a compensating stream from said high pressure stage;

(h) partially warming said compensating stream in indirect heat exchange with said major stream of the air feed being cooled in step (e), and also warming said compensating stream in indirect heat exchange with resultant compressed minor stream of the air feed, the partially warming of said compensating stream being conducted in a heat exchanger distinct and independent from said condenser-evaporator of step (c), said compressed minor stream of air feed is first passed through said independent and distinct heat exchanger for warming said compensating stream before said compressed minor stream is passed into said condenser-evaporator of step (c),

(i) expanding resultant partially warmed stream in a turbine; and

(j) employing resultant mechanical energy directly from the turbine for said further recompressing of said subdivided minor stream of the feed air in a coupled brake blower.

4,133,663

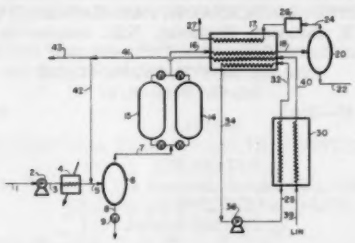
REMOVING VINYL CHLORIDE FROM A VENT GAS STREAM

Ronald W. Skinner, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 29, 1976, Ser. No. 671,122

Int. Cl.² F25J 3/00

U.S. Cl. 62—18 **1 Claim**



1. A process for forming an environmentally acceptable vent gas stream having a vinyl chloride concentration of 10 parts per million or less from a vinyl chloride polymerization process wherein said vent gas from said process contains water, carbon dioxide, vinyl chloride, oxygen, and inert gas which comprises the steps:

(A) reducing the concentration of water in the vent gas stream to less than 1 part per million;

(B) reducing the carbon dioxide content in the vent gas stream to less than 1 part per million;

(C) cooling the vent gas stream to a temperature of −215 to −235° F in indirect heat exchange using cryogenic nitrogen as the refrigerant thereby forming a vinyl chloride condensate in said vent gas stream;

(D) combining a sufficient proportion of the thus warmed refrigerant nitrogen in Step C with the vent gas stream prior to cooling to reduce the oxygen concentration to a level below the flammability range;

(E) separating the condensed vinyl chloride from the thus cooled gas stream in Step C;

(F) separating the condensed vinyl chloride from the cooled gas stream thereby forming a stripped gas stream and a vinyl chloride condensate;

(G) recycling the stripped gas stream to the cooling zone for recovering the refrigeration therefrom;

(H) passing said stripped gas stream through an activated carbon bed to remove residual vinyl chloride; and

(I) recovering condensed vinyl chloride from separation Step F.

4,133,664
APPARATUS AND METHOD FOR PRODUCING LIGHT CONDUCTING FIBERS HAVING A CORE DISPOSED IN A LOOSE FITTING CLADDING TUBE

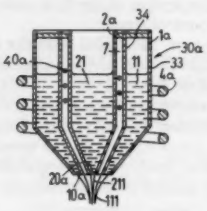
Hubert Aulich, Munich; Josef Grabmaier, Kempfenhausen, and Karl-Heinz Eisenrith, Schliersee, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jun. 28, 1977, Ser. No. 810,760

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1976, 2629658

Int. Cl.² C03B *37/02*

U.S. Cl. 65—3 A **10 Claims**



1. An apparatus for producing a light conducting fiber having a core disposed in a loose fitting cladding tube with a space therebetween, said apparatus comprising a double crucible arrangement having a first crucible for accommodating a melt for the cladding tube and a second crucible for accommodation of a melt for the core, said second crucible being provided with a circular orifice of a given diameter and the first crucible having a ring-shaped orifice with an inner diameter greater than the given diameter of the circular orifice of the second crucible, said first and second crucible being arranged with the center of the ring-shaped orifice being substantially on a central axis of the circular orifice of the second crucible with the inner diameter being spaced from a periphery of the circular orifice so that the core drawn from the circular orifice of the second crucible is substantially concentrically disposed within and spaced from the tube of material drawn from the ring-shaped orifice.

4,133,665
HYDRATION OF SILICATE GLASSES IN ALCOHOL-WATER SOLUTIONS

Roger F. Bartholomew; William L. Haynes, both of Painted Post, and Leon M. Sanford, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Sep. 1, 1977, Ser. No. 829,731

Int. Cl.² C03C *15/00*; C03B *21/00*

U.S. Cl. 65—30 E **13 Claims**

1. A method for making a hydrated glass body which can exhibit improved mechanical strength, impact resistance, Knoop hardness, and chemical durability which consists of the following steps:

(a) melting a batch for an anhydrous glass consisting essentially, in mole percent on the oxide basis, of about 3–25% Na_2O and/or K_2O and 50–95% SiO_2, the sum of those components constituting at least 55% of the total composition;

(b) forming said melt into an anhydrous glass body of a desired geometry;

(c) contacting at least a portion of said glass body with a short chain aliphatic alcohol-H_2O containing liquid or gaseous environment in a closed autoclave system at a temperature greater than 100° C. but less than the softening point of the anhydrous glass and at a pressure in excess of atmospheric pressure for a period of time sufficient to hydrate and dealkalize at least said portion of said glass body in an amount effective to impart improved mechanical strength, impact resistance, Knoop hardness, and chemical durability thereto; and then

(d) cooling said hydrated and dealkalized glass body to room temperature.

8. A method for making an hydrated glass body which can exhibit improved mechanical strength, impact resistance, Knoop hardness, and chemical durability which consists of the following steps:

(a) melting a batch for an anhydrous glass consisting essentially, in mole percent on the oxide basis, of about 3–25% Na_2O and/or K_2O and 50–95% SiO_2, the sum of those components constituting at least 55% of the total composition;

(b) forming said melt into an anhydrous glass body of a desired geometry;

(c) contacting at least a portion of said glass body with a gaseous or liquid H_2O-containing environment in a closed autoclave system at elevated temperatures and pressures for a period of time sufficient to hydrate at least said portion of said glass body having an amount of H_2O absorbed therein effective to impart thermoplastic properties thereto;

(d) contacting said hydrated portion of said glass body with a short chain aliphatic alcohol or short chain aliphatic alcohol-H_2O containing liquid or gaseous environment in a closed autoclave system at a temperature between about 75° C. below the transformation range to about 50° C. thereabove at a pressure in excess of atmospheric pressure for a period of time sufficient to dealkalize said portion of said glass body in an amount effective to impart improved mechanical strength, impact resistance, Knoop hardness, and chemical durability thereto; and then

(d) cooling said hydrated-dealkalized glass body to room temperature.

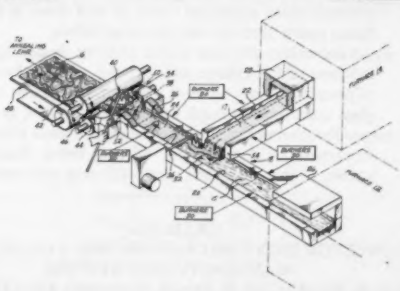
4,133,666
METHOD AND APPARATUS FOR MAKING VARIEGATED GLASS IN A CONTINUOUS SHEET

Jerry D. Rhodes, Kent, and Roger B. Ek, Bellevue, both of Wash., assignors to Spectrum Glass Company, Inc., Seattle, Wash.

Filed Apr. 28, 1978, Ser. No. 901,077

Int. Cl.² C03B *13/08*

U.S. Cl. 65—101 **17 Claims**



1. A process for making variegated glass in continuous sheet form, comprising:

heating first and second components of glass of different preselected colors, to a molten state;

introducing said components of glass into a channel shaped forehearth and establishing a "plug" flow of said components toward a discharge end of said forehearth, said "plug" flow being an unblended confluent of said first and second components of glass while in said molten state wherein said components remain in discrete domains having substantially abrupt transitions in color at the interfaces between such domains;

stirring said confluent as it flows in said forehearth so as to break up and disperse said domains throughout the vol-

ume of said confluent while maintaining said substantially abrupt transitions in color between said domains;

flowing said confluent over a weir, located at the discharge end of said forehearth, into a feed side of a pair of forming rollers which press the confluent of glass into the shape of a continuously elongate sheet;

adjusting the volumetric flow rate of said confluent by so metering the rate of introduction of said components into said forehearth and by so inclining said channel shaped forehearth so that said flow rate is just sufficient to supply enough molten glass at the discharge end of the forehearth for enabling the forming rollers to produce said sheet with a substantially uniform predetermined width, without causing a buildup of excessive molten glass at the feed side of said rollers; and

supplementing the volume of said confluent of molten glass that flows naturally, by gravity over said weir and to the feed side of said forming rollers with supplementary quantities of molten glass taken from a reservoir of said confluent of glass that develops on the upstream side of said weir in order to alleviate transient shortfalls of said confluent at the feed side of said rollers, wherein said transient shortfalls occur as a result of unsteady flow of said confluent due to frictional effects in conjunction with said step of adjusting the volumetric flow rate of said confluent to be just sufficient to supply said forming rollers.

14. In an apparatus for producing variegated glass in continuous elongate sheet form and including a channel shaped forehearth into which molten glass prepared from at least first and second differently colored glass components is introduced at a receiving end of said forehearth and the confluent thereof is caused to flow by gravity toward a discharge end of said forehearth at which forming rollers receive the molten glass and press it into a continuous elongate sheet of glass having a predetermined minimum width, wherein the improvement comprises:

said forehearth having a width that is substantially less than said predetermined width of said sheet at locations upstream of said discharge end and being inclined downwardly in the direction of flow and being divergent in the direction of flow at a location adjacent said discharge end so that the flow of said confluent widens to match said predetermined minimum width of said sheet as said confluent passes through said forming rollers;

structural means disposed in said channel shaped forehearth adjacent said discharge end forming a cross-channel weir of preselected height, over which the confluent of molten glass must flow to reach said forming rollers; and

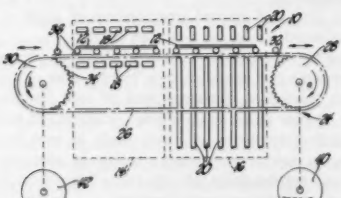
means for stirring the confluent of molten glass while in said forehearth, said means for stirring being disposed upstream of said structural means forming said weir.

4,133,667

CONVEYOR DRIVE MECHANISM FOR A GLASS SHEET MANUFACTURING SYSTEM

John S. Nitschke, 324 E. Second, Perrysburg, Ohio 43551

Filed Mar. 20, 1978, Ser. No. 888,073
Int. Cl.[2] C03B *27/00*
U.S. Cl. 65—163 **33 Claims**



1. A conveyor drive system for transporting a sheet glass load through a glass processing station along a direction of travel comprising:

a conveyor drive defined by at least one continuous drive loop trained over first and second pulleys mounted at opposed ends of a lateral side of the processing station;

a plurality of elongate rollers spaced apart from one another along the direction of travel and extending transversely with respect thereto, the plurality of rollers being in driving engagement with the conveyor drive for rotational motion upon motion of the continuous drive loop;

first torque means, coupled to the first pulley of the conveyor drive and responsive to a first control signal, for applying a drive torque to the first pulley in accordance with the first control signal;

second torque means, associated with the second pulley of the conveyor drive, for applying a counter-drive torque to the second pulley; and

control means, responsive to a transport speed command signal, for providing the first control signal to drive the first pulley in accordance with the transport speed command while at all times maintaining a minimum predetermined level of tension in the continuous drive loop.

4,133,668

MULTICOMPONENT SOIL SUPPLEMENT

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Jun. 9, 1977, Ser. No. 805,130
Int. Cl.[2] C05D *9/02;* C05B *15/00, 19/00*
U.S. Cl. 71—11 **8 Claims**

1. The method of producing a soil amendment comprising a homogeneous, solid fusion of particulate mineral nutrients and hydrocarbon evenly dispersed throughout a continuous rhombic sulfur matrix and said solid fusion also containing at least about 50 weight percent sulfur based on the total weight of said amendment, said method including the steps of (a) forming a sulfur melt at a melt temperature of about 120° to about 400° C., (b) dispersing throughout said melt about 1 to about 50 weight percent based on said amendment of a nutrient-hydrocarbon comixture wherein at least about 10 weight percent based on said comixture is a finely divided water-insoluble plant nutrient compound selected from the group consisting of calcium phosphate and zinc, iron, copper, magnesium, manganese, molybdenum, and boron oxides, sulfides and carbonates, and combinations thereof, the compound being coated with or suspended in at least about 2 weight percent of a nonpolar hydrocarbon based on the combined weight of said nutrient and non-polar hydrocarbon, said non-polar hydrocarbon being non-reactive with said sulfur at said temperature and being selected from the group consisting of paraffinic and aromatic hydrocarbons and combinations thereof having melting points below said melt temperature and boiling points above said melt temperature, and (c) cooling the resulting combination of said hydrocarbon and said nutrient homogeneously distributed throughout said sulfur matrix to a temperature below the sulfur melting point to form said homogeneous, solid fusion.

4,133,669

PROCESS FOR PELLETIZING A SULPHUR-BENTONITE CLAY MIXTURE AND THE PRODUCT FORMED THEREBY

Bob L. Caldwell, Big Sandy, Tex., and Ronald B. Fletcher, Calgary, Canada, assignors to Agri-Prassco Joint Venture, Calgary, Canada and Agri-Sul Equipment, Mineola, Tex., part interest to each

Filed Apr. 20, 1977, Ser. No. 789,094
Int. Cl.[2] C05G *3/04*
U.S. Cl. 71—3 **13 Claims**

1. A process for the manufacture of solid pellets of a water-degradable solid suspension of bentonite clay in elemental sulphur, comprising the steps of:

adding one to three parts (out of ten parts) of substantially

dry clay dust to seven to nine parts of molten sulphur with continuous and thorough mixing in a mix-tank at an elevated temperature between 238° F. and 300° F.;

forming droplets of the mixture;

providing a nitrogen containing liquid fertilizer solution, said solution containing a non-degrading amount of water;

feeding said droplets into said liquid fertilizer soltuion;

passing said droplets through said liquid fertilizer solution for a time sufficient to anneal the droplets into pellets; and

removing said annealed pellets from said liquid fertilizer solution.

11. The process according to claim 1 wherein said liquid fertilizer solution is a 10-34-0 grade liquid fertilizer.

4,133,670
METHOD OF PREPARING LIQUID MONOAMMONIUM PHOSPHATE FERTILIZER SUSPENSION

Michael D. Byrd, Parkville, and August R. Scott, Kansas City, both of Mo., assignors to Farmland Industries, Inc., Kansas City, Mo.

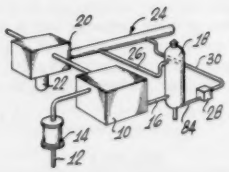
Filed Sep. 14, 1977, Ser. No. 833,151
Int. Cl.² C05B 7/00
U.S. Cl. 71—34 **6 Claims**

1. In a batch method of producing a sprayable monoammonium phosphate based suspension fertilizer using conventional batch equipment wherein respective quantities of monoammonium phosphate, anhydrous ammonia and water necessary to produce a batch of said fertilizer of predetermined size are admixed in a reaction zone, the improvement which comprises the steps of first adding from about 60% to about 90% by weight of the quantity of monoammonium phosphate fertilizer to be used in said batch to the entire quantity of water to be incorporated therein to produce a first mixture in said zone, then introducing the entire quantity of anhydrous ammonia into the mixture which is required for said batch thus effecting increase in temperature thereof because of exothermic reaction of the ammonia with the monoammonium phosphate and dilution of the ammonia with water, and prior to cooling of the admixture to essentially ambient temperature, adding the remaining portion of said quantity of monoammonium phosphate at a rate to produce a sprayable monoammonium phosphate based suspension fertilizer product having less than about 2% by weight of monoammonium phosphate crystals which are larger than approximately +20 mesh size.

4,133,671
METHOD AND APPARATUS FOR ENHANCING FERTILIZING CHARACTERISTICS OF IRRIGATION WATER

Merle E. Mikel, Visalia, Calif., assignor to Fuel, Inc., Hugoton, Kans.

Continuation-in-part of Ser. No. 786,198, Apr. 11, 1977, abandoned. This application Mar. 22, 1978, Ser. No. 888,840
Int. Cl.² C05C 11/00
U.S. Cl. 71—54 **5 Claims**



1. A method for producing and adding fertilizing ingredients to irrigation water by converting exhaust gases from an engine to obtain an aqueous solution comprising from about 15 to 50 ppm CO_2 and about 2 ppm nitrogen, the method comprising the steps of:

operating an internal combustion engine, said engine being operated at a temperature range of 1200° F. to 1500° F. in the combustion chamber of said engine and with an air to fuel ratio ranging from about 12 to 15 parts air to 1 part fuel and increasing the voltage from 15,000 volts to about 40,000 to 50,000 volts across the spark plugs of the engine so as to produce an exhaust gas having a maximum of carbon dioxide and nitrogen oxide gases;

absorbing carbon dioxide and nitrogen oxide gases in water to form treated water; and

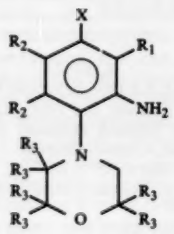
adding said treated water to said irrigation water.

4,133,672
(AMINOPHENYL)MORPHOLINES AND USE THEREOF

Kelvin K. Shen, Fountain Valley, Calif., and Wayne S. Belles, Moscow, Id., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

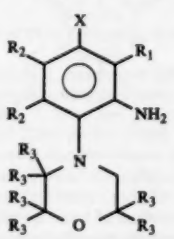
Filed Feb. 7, 1977, Ser. No. 766,289
Int. Cl.² C07D 295/12; A01N 9/22
U.S. Cl. 71—88 **13 Claims**

1. A compound of the formula



wherein X is selected from halo-lower alkyl and branched chain alkyl groups of 3 to about 6 carbon atoms, R_1 represents hydrogen or halo, each R_2 is selected from hydrogen, halo, lower alkyl, lower alkoxy, and amino and each R_3 is selected from hydrogen and lower alkyl.

8. A herbicidal composition comprising an herbicidally effective amount of a compound according to the formula



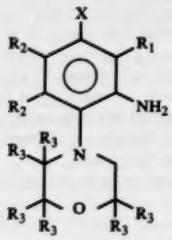
a surfactant and an inert carrier therefor, wherein X is selected from halo-lower alkyl and branched-chain alkyl groups of 3 to about 6 carbon atoms and R_1, R_2 and R_3 are hydrogen.

4,133,673
(AMINOPHENYL)MORPHOLINES

Kelvin K. Shen, Fountain Valley, Calif., and Wayne S. Belles, Moscow, Id., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

Division of Ser. No. 766,289, Feb. 7, 1977. This application Apr. 25, 1978, Ser. No. 899,955
Int. Cl.² C07D 295/06; A01N 9/14
U.S. Cl. 71—88 **10 Claims**

1. A compound of the formula



wherein X is selected from lower alkylsulfonyl and halo-lower alkylsulfonyl, R_1 represents hydrogen, nitro or halo, each R_2 is selected from hydrogen, halo, lower alkyl, lower alkoxy, amino and nitro and each R_3 is selected from hydrogen and lower alkyl.

2. A compound according to claim 1 in which R_1, R_2 and R_3 are hydrogen.

4. A herbicidal composition comprising a herbicidally effective amount of a compound according to claim 2, a surfactant and an inert carrier therefor.

4,133,674

HERBICIDAL HETEROCYCLIC COMPOUNDS

David Cartwright, Reading, and Philip L. Urlwin-Smith, Sunninghill, both of England, assignors to Imperial Chemical Industries Limited, London, England

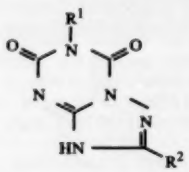
Filed May 3, 1977, Ser. No. 793,271

Claims priority, application United Kingdom, May 12, 1976, 19488/76

Int. Cl.[2] A01N *9/22*; C07D *251/08*

U.S. Cl. 71—93 10 Claims

1. A process of severely damaging or killing unwanted plants, which comprises applying to the plants, or to the growth medium thereof, a triazolotriazine compound of the formula:



or an agriculturally acceptable salt thereof, wherein R^1 is an alkyl or cycloalkyl radical of 1 to 8 carbon atoms, and R^2 is a hydrogen atom; an alkyl or cycloalkyl radical of 1 to 6 carbon atoms; an alkylthio radical of 1 to 6 carbon atoms; or a dialkylamino radical wherein the two alkyl radicals each contain from 1 to 6 carbon atoms.

4,133,675

PYRIDYLOXY-PHENOXY-ALKANECARBOXYLIC ACID DERIVATIVES WHICH ARE EFFECTIVE AS HERBICIDES AND AS AGENTS REGULATING PLANT GROWTH

Rolf Schurter, and Hermann Rempfler, both of Binningen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

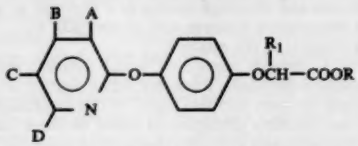
Filed Jul. 18, 1977, Ser. No. 816,840

Claims priority, application Switzerland, Jul. 23, 1976, 9470/76; Jul. 23, 1976, 9471/76

Int. Cl.[2] A01N *9/22*; C07D *213/57*

U.S. Cl. 71—94 12 Claims

1. A pyridyloxy-phenoxy-alkanecarboxylic acid derivatives of the formula I



(I)

wherein

A represents hydrogen, halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, cyano, or nitro,

B represents hydrogen, halogen, cyano, C_1–C_4-alkyl, a mono- or di-C_1–C_4-alkylamino group,

C represents hydrogen, halogen, cyano, or nitro,

wherein at least one of A, B or C is cyano,

D represents hydrogen, halogen, C_1–C_4-alkyl or a mono- or di-C_1–C_4-alkylamino group,

R_1 represents hydrogen, C_1–C_4-alkyl optionally substituted by C_1–C_4-alkoxy, or phenyl,

R represents hydrogen or a cation $1/n\ M^{n\oplus}$, a C_1–C_{18}-alkyl group, which is unsubstituted or substituted by C_1–C_4 -alkoxy, C_1–C_4-alkylthio, carboxyl, C_1–C_4-alkoxycarbonyl, C_3–C_{12}-cycloalkyl, phenyl or a 5-6-membered heterocyclic ring, a C_3–C_{12}-cycloalkyl group, a C_3–C_8 -alkenyl group or halogenolkenyl group, a C_3–C_8-alkynyl group, or a phenyl group which is unsubstituted or is mono- or polysubstituted by halogen, C_1–C_4-alkyl, C_1–C_4 -alkoxy, C_1–C_4-alkylthio, cyano or nitro,

$1/n\ M^{n\oplus}$ represents the ion equivalent of an alkali metal ion, an alkaline-earth metal ion, a copper ion or an iron ion, or a quaternary alkylammonium group or hydroxyalkylammonium group.

11. A method for the combatting of weeds in crops of cultivated plants comprising applying a herbicidally effective amount of a compound according to formula I of claim 1.

4,133,676

ACICULAR FERROMAGNETIC METAL PARTICLES AND METHOD FOR PREPARATION OF THE SAME

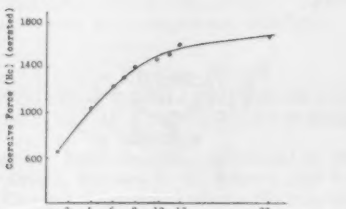
Masakazu Oshimura; Kenichi Yokoyama; Yukihiro Hayashi, and Akira Miyake, all of Ibaraki, Japan, assignors to Hitachi Maxell, Ltd., Ibaraki, Japan

Filed Dec. 16, 1977, Ser. No. 861,514

Claims priority, application Japan, Dec. 20, 1976, 51-153838

Int. Cl.[2] H01F *1/06*

U.S. Cl. 75—0.5 AA 12 Claims



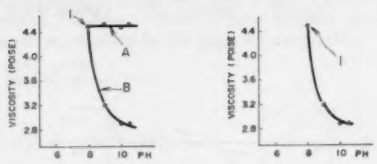
1. An acicular ferromagnetic metal particle comprising iron element as the essential component, which has a particle size of 0.1 to 1 μm and a dimension of crystallite-size of not more than 215 A in the effective thickness of the crystallite in the direction perpendicular to the reflecting plane (110) (D_{110}).

4,133,677

PROCESS FOR PRODUCING ACICULAR MAGNETIC METALLIC PARTICLE POWDER

Goro Matsui; Koji Toda; Atushi Takedoi, and Nanao Horiishi, all of Hiroshima, Japan, assignors to Toda Kogyo Corp., Hiroshima, Japan

Filed Mar. 31, 1977, Ser. No. 783,326
Claims priority, application Japan, Apr. 5, 1976, 51-39027; Jun. 14, 1976, 51-70231
Int. Cl.[2] C22C *1/04*
U.S. Cl. 75—0.5 AA 7 Claims



1. A process for producing acicular magnetic metallic particles comprising the steps of:

preparing an aqueous suspension of at least one acicular metal oxide particles as starting material selected from the group consisting of acicular ferric oxide particles, acicular iron (III) oxide hydroxide particles and each of these ones containing Co and/or Ni while adjusting the pH of the suspension at a value higher than 8;

adding an amorphous water-soluble silicate into the suspension as fully agitated under non-oxidizing atmosphere so as to prevent the hydrolytic and oxidative decomposition of the amorphous silicate in the suspension into crystalline silica through this step while the pH of the suspension is in the range of 8–12, thereby providing homogeneous and dense coats of amorphous silicate on the acicular metal oxide particles;

converting the resultant amorphous silicate coats on the particles into the crystalline silica coats by water-washing or neutralization with acid; and

thereafter heating the particles in a stream of reducing gas at a temperature between 400°–800° C. and to thereby obtain acicular magnetic metallic particles.

4,133,678

FERRO-ALLOY PROCESS AND PRODUCT

Ardaches Sarian, 2600 Bathurst #701, Toronto, Ontario, Canada (M6B 2Z4), and Andres G. Sarian, 66 Collier St., #9C, Toronto, Ontario, Canada (M6W 1L9)

Continuation-in-part of Ser. No. 794,106, May 5, 1977, abandoned. This application Aug. 24, 1977, Ser. No. 827,325
Claims priority, application Canada, Aug. 26, 1976, 259900
Int. Cl.[2] C21C *7/00*
U.S. Cl. 75—53 14 Claims

1. A method of producing a ferronitride comprising mixing flue-dust containing iron oxide with metallic iron ejections consisting of grits, sludges or powders to form a mixture which contains no alloyed manganese or chromium, grinding said mixture to form a fine powder, grading said fine powder to obtain a fraction of below 30 microns in size, reducing the iron oxide in said fraction to metallic iron thereby forming a metallic fraction, nitriding said metallic fraction to form a ferronitride.

4,133,679

IRON-REFRACTORY METAL-BORON GLASSY ALLOYS

Ranjan Ray, Randolph, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jan. 3, 1978, Ser. No. 866,675
Int. Cl.[2] C22C *38/12, 27/04, 30/00*
U.S. Cl. 75—123 B 7 Claims

1. A substantially totally glassy alloy consisting essentially of about 5 to 12 atom percent boron, a member selected from the group consisting of about 25 to 40 atom percent molybdenum and about 13 to 25 atom percent tungsten and the balance essentially iron plus incidental impurities.

4,133,680

METHOD OF PRODUCING DOPANT MATERIAL FOR IRON OR NICKEL-BASE ALLOYS

Jury Z. Babaskin, ulitsa Zhelyabova, 10A, kv. 82; Viktor A. Efimov, ulitsa Vladimirskaya, 51/53, kv. 88; Leonid A. Sokirko, ulitsa Uritskogo, 102/7, kv. 53; Leonora A. Rostovskaya, ulitsa Dobrokhotova, 6, kv. 1A; Sergei Y. Shipitsyn, bulvar Lesi Ukrainki, 2, kv. 39; Georgy D. Semenyaka, ulitsa Semashko, 8, kv. 55/55, and Georgy G. Lutsenko, ulitsa Borschagovskaya, 46/1, kv. 27, all of Kiev, U.S.S.R.

Continuation of Ser. No. 690,777, May 27, 1976, abandoned, which is a continuation of Ser. No. 469,751, Sep. 14, 1974, abandoned. This application Nov. 22, 1977, Ser. No. 854,018
Int. Cl.[2] C22C *38/22*
U.S. Cl. 75—129 4 Claims

1. A method of producing a dopant material comprising the steps of melting a dopant base metal selected from the group consisting of iron and nickel; adding rare earth metals, manganese, silicon, molybdenum, and chromium to the molten metal; heating the molten metal to a temperature above that required for the dissolution and formation of high melting point compounds selected from the group consisting of carbides, nitrides, carbonitrides, borides, and oxides of a metal selected from the group consisting of titanium, zirconium, tantalum, hafnium, and thorium; adding non-metallic elements selected from the group consisting of carbon, nitrogen, oxygen, boron, and elements selected from the group consisting of titanium, zirconium, tantalum, hafnium, and thorium to the molten mixture in stoichiometric ratio and in weight amounts which provide for the formation of from 3 to 25 volume percent of said high melting point compounds in said dopant material; and cooling said molten mixture at a rate of from 10^2 to 10^7 degrees per second resulting in the formation of said endogenous high melting point compounds having a particle size of not more than 5 microns in said dopant material.

4,133,681

NICKEL-REFRACTORY METAL-BORON GLASSY ALLOYS

Ranjan Ray, Randolph, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jan. 3, 1978, Ser. No. 866,670
Int. Cl.[2] C22C *19/03, 27/04, 30/00*
U.S. Cl. 75—170 7 Claims

1. A substantially totally glassy alloy consisting essentially of about 5 to 12 atom percent boron, a member selected from the group consisting of about 30 to 60 atom percent molybdenum and about 20 to 35 atom percent tungsten and the balance essentially nickel plus incidental impurities.

4,133,682

COBALT-REFRACTORY METAL-BORON GLASSY ALLOYS

Ranjan Ray, Randolph, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

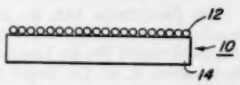
Filed Jan. 3, 1978, Ser. No. 866,671
Int. Cl.[2] C22C *19/03, 27/04, 30/00*
U.S. Cl. 75—170 7 Claims

1. A substantially totally glassy alloy consisting essentially of about 5 to 12 atom percent boron, a member selected from the group consisting of about 20 to 50 atom percent molybdenum and about 15 to 40 atom percent tungsten and the balance essentially cobalt plus incidental impurities.

4,133,683
AGGLOMERATION IMAGING METHOD

Werner E. L. Haas, Webster; Bela Mechlowitz, Rochester, and James E. Adams, Ontario, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 29, 1973, Ser. No. 327,333
Int. Cl.[2] G03G 13/22
U.S. Cl. 96—1 PS 18 Claims



1. In an agglomeration imaging method of the type wherein an imaging member comprising an agglomerable layer, on a substrate, comprises agglomerable material and is imaged to provide a first portion of said agglomerable layer with agglomerable material in one of non-agglomerated and agglomerated states said first portion being in image configuration, and a second portion of said agglomerable layer being in a complimentary image configuration and comprising agglomerates of said agglomerable material which are larger in size than agglomerates, if any, of said agglomerable material in said first portion; the improvement of image contrast, wherein the improvement comprises: contacting said imaged member with a liquid solvent or a chemical reactant for said agglomerable material to dissolve or chemically react with the first portion of said agglomerable layer at a faster rate than with the second portion of said agglomerable layer comprising said larger agglomerates.

4,133,684
ELECTROPHOTOGRAPHIC MATERIAL WITH INTERMEDIATE LAYER

Noriyoshi Tarumi, Tama; Akihiko Tamura, and Masakazu Kokiso, both of Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

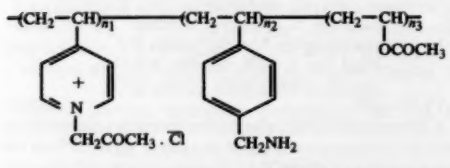
Filed Mar. 21, 1977, Ser. No. 779,682
Claims priority, application Japan, Mar. 22, 1976, 51/29826; Apr. 6, 1976, 51/37745
Int. Cl.[2] G03G 5/05
U.S. Cl. 96—1.5 R 6 Claims

1. An electrophotographic photosensitive material comprising:

(a) a substrate;

(b) a protective conductive layer disposed upon said substrate, said layer being comprised of a resin having carbon particles dispersed therein;

(c) an intermediate layer disposed upon said protective conductive layer, which intermediate layer includes the crosslinked product of an epoxy resin having at least two epoxy groups and a cation conductive agent selected from the group consisting of the compounds represented by the following structural formulae:



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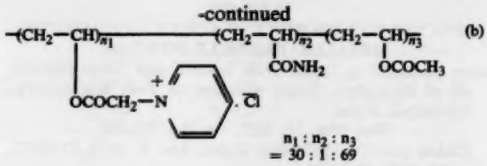
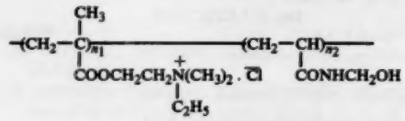
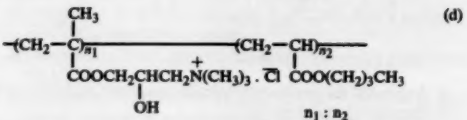
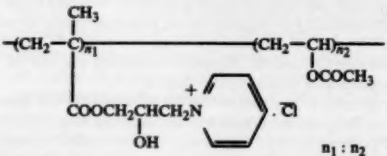








wherein n_1, n_2 and n_3 show, respectively, the polymerization mol % of each of the component monomers; and

(d) a photosensitive layer disposed upon said intermediate layer.

4,133,685
LITHOGRAPHIC PLATE AND PHOTORESIST HAVING PHOTOSENSITIVE LAYERS OF DIAZO AND CINNAMOYLATED POLYVINYL ALCOHOL MATERIALS

Daniel C. Thomas, Wheaton, Ill., and Jack L. Sorkin, University Heights, Ohio, assignors to Richardson Chemical Company, Des Plaines, Ill.

Continuation of Ser. No. 755,932, Dec. 30, 1976, abandoned, which is a continuation of Ser. No. 541,455, Jan. 16, 1975, abandoned, which is a continuation-in-part of Ser. No. 435,340, Jan. 21, 1974, abandoned, which is a continuation of Ser. No. 829,149, May 29, 1969, Pat. No. 3,808,004. This application Jan. 17, 1978, Ser. No. 870,197
Int. Cl.[2] G03C 1/52, 1/68; G03F 7/08
U.S. Cl. 96—68 1 Claim

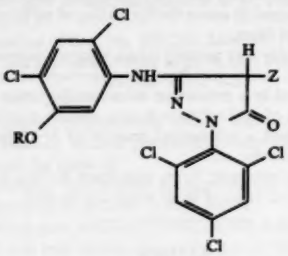
1. A high-speed presensitized plate for lithography or photoresist etching, including in combination a plate base, a sub-base coating over said plate base, a layer of a light sensitive diazo resin condensation product of an aldehyde and a diazonium compound over the sub-base coating and a cinnamate photopolymer coating over said diazo resin layer, wherein the photopolymer coating contains cinnamoylated polyvinyl alcohol polymer.

4,133,686
COLOR PHOTOGRAPHIC LIGHT-SENSITIVE ELEMENT

Seiji Ichijima, and Nobuo Furutachi, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 27, 1977, Ser. No. 846,071
Claims priority, application Japan, Oct. 29, 1976, 51-130770
Int. Cl.² G03C *1/40*
U.S. Cl. 96—74 **4 Claims**

1. A color photographic light-sensitive element comprising a support having thereon a silver halide emulsion layer containing therein a 3-anilino-2-pyrazolin-5-one magenta color forming coupler represented by the general formula (II):



(II)

wherein R represents an alkyl group and Z represents a hydrogen atom.

3. The color photographic light-sensitive element of claim 1, wherein said silver halide emulsion layer is a green sensitive silver halide emulsion layer containing said magenta color forming coupler represented by the general formula (I) and said color photographic light-sensitive element additionally includes a red sensitive silver halide emulsion layer containing a phenolic or naphtholic cyan color forming coupler, and a blue sensitive silver halide emulsion layer containing an acylacetamido yellow color forming coupler.

4,133,687
PHOTOGRAPHIC ELEMENTS HAVING HYDROPHILIC COLLOID LAYERS CONTAINING COMPOUNDS HAVING ACTIVATOR PRECURSORS AND HYDROPHOBIC DEVELOPING AGENTS UNIFORMLY LOADED IN LATEX POLYMER PARTICLES

Tsang J. Chen, and Donald F. McLaen, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 8, 1977, Ser. No. 814,015
Int. Cl.² G03C *1/48, 1/06, 1/72, 1/02*
U.S. Cl. 96—76 R **19 Claims**

1. A photographic element comprised of a support and, coated on the support,

a hydrophilic colloid layer comprised of

a hydrophilic colloid, and within the hydrophilic colloid,

an activator precursor which is a compound of a protonated basic nitrogen-containing moiety and an acid anion,

loaded polymer particles of from 0.02 to 0.2 micron in average diameter consisting essentially of

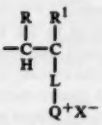
a hydrophobic polymer of which at least 2 percent by weight is comprised of ionizable repeating units capable of forming hydrophilic homopolymers, at least half of said ionizable repeating units being cationically ionizable, and

a hydrophobic developing agent loaded into and distributed through said particles, the weight ratio of said developing agent to said polymer being from about 1:4 to 3:1,

in said hydrophilic colloid layer or in an adjacent hydrophilic colloid layer, radiation-sensitive silver halide grains, and

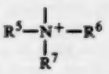
said activator precursor being present in a concentration of from 1 to 4 equivalents for each mole of said radiation-sensitive silver halide, and

wherein said ionizable repeating units of said hydrophobic polymer are cationically ionizable and are represented by the formula



wherein,

R and R^1 are independently chosen from among hydrogen, alkyl and aryl groups, L is a divalent linking group and Q^+ is a group of the formula



where R^5, R^6 and R^7 are independently chosen from the group consisting of alkyl, aryl, alkaryl and aralkyl, and X^- is an anion.

4,133,688
PHOTOGRAPHIC CARRIER MATERIAL CONTAINING THERMOPLASTIC MICROSPHERES

Wieland H. Sack, Bissendorf, Fed. Rep. of Germany, assignor to Felix Schoeller, Jr., Fed. Rep. of Germany

Continuation-in-part of Ser. No. 651,602, Jan. 22, 1976, abandoned. This application Jul. 8, 1977, Ser. No. 813,878
Claims priority, application United Kingdom, Jan. 24, 1975, 03261/75
Int. Cl.² D21H *1/28, 3/00*; G03C *1/87*
U.S. Cl. 96—87 R **14 Claims**

1. A photographic carrier material comprising a dried cellulose sheet coated on both surfaces thereof with a polyolefin resin suitable for the deposition of at least one light sensitive liquid developable layer thereon, the improvement in said coated sheet comprising a plurality of hollow, thermoplastic microspheres substantially uniformly mixed in said cellulose sheet in an amount of about 0.5 – 5.0 weight percent based on the cellulose.

4,133,689
SUBMICRON BETA SILICON CARBIDE POWDER AND SINTERED ARTICLES OF HIGH DENSITY PREPARED THEREFROM

Frederick G. Stroke, McMurray, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 637,342, Dec. 3, 1975, abandoned. This application May 10, 1978, Ser. No. 904,704
Int. Cl.² C04B *35/56*
U.S. Cl. 106—44 **11 Claims**

1. A process for preparing boron doped submicron beta silicon carbide powder having from traces to less than one weight percent alpha silicon carbide, capable of being pressure-less sintered to articles having a density of at least 85 percent of the theoretical density for silicon carbide, by gas phase reaction of silicon, boron and carbon source reactants in the presence of hydrogen in a reactor, which comprises projecting a hot stream of hydrogen produced by heating hydrogen in hydrogen plasma generating means into a reaction zone in a recirculating-type reactor, introducing gaseous silane, boron source and halogenated hydrocarbon source reactants into said reaction zone, said boron source reactant being present in amount sufficient to provide between 0.15 and 4 weight percent boron in the silicon carbide powder, the halogenated hydrocarbon source reactant being present in an amount sufficient to provide between 0.05 and 1.5 weight percent free carbon in the silicon carbide powder, and the heat content of the hot hydrogen stream and the reactants being sufficient to

establish beta silicon carbide forming temperatures in said reaction zone, reacting said silane, boron source and halogenated hydrocarbon source reactants in the reaction zone in the presence of an excess of the theoretical demand for hydrogen, the apparent residence time of the reactants in the reactor being between about 0.05 and about 0.5 seconds, and removing said solid boron doped submicron beta silicon carbide powder having a surface area of between 3 and 15 square meters per gram from the reactor, at least 90 percent of the silicon carbide particles having an equivalent spherical diameter less than one micron.

7. A process for preparing boron doped submicron beta silicon carbide powder having from traces to less than one weight percent alpha silicon carbide by gas phase reaction of silicon, boron and carbon source reactants in the presence of hydrogen in a reactor, which comprises projecting a hot stream of hydrogen produced by heating hydrogen in hydrogen plasma generating means into a reaction zone in a recirculating-type reactor, introducing gaseous silane, boron source and carbon source reactant selected from the group consisting of hydrocarbons and halogenated hydrocarbons that are readily volatile at the gas phase reaction temperature into said reaction zone, said boron source reactant being present in amount sufficient to provide between 0.15 and 4 weight percent boron in the silicon carbide powder, the carbon source reactant being present in an amount sufficient to provide between 0.05 and 1.5 weight percent free carbon in the silicon carbide powder, and the heat content of the hot hydrogen stream and the reactants being sufficient to establish beta silicon carbide forming temperatures in said reaction zone, reacting said silane, boron source and carbon source reactants in the reaction zone in the presence of an excess of the theoretical demand for hydrogen, the apparent residence time of the reactants in the reactor being between about 0.05 and about 0.5 seconds, withdrawing from the reactor a reactor effluent comprising a gaseous suspension of solid silicon carbide particles, and separating from said reactor effluent solid boron doped submicron beta silicon carbide powder having from traces to less than one weight percent alpha silicon carbide, at least 90 percent of the silicon carbide particles having an equivalent spherical diameter less than one micron, which beta silicon carbide powder is capable of being pressureless sintered to articles having a density of at least 85 percent of the theoretical density for silicon carbide.

4,133,690

GLASS COMPOSITION FOR PASSIVATING SEMICONDUCTOR SURFACES

Gerd Muller, Mainz-Weisenau, Fed. Rep. of Germany, assignor to Jenaer Glaswerk Schott & Gen., Mainz, Fed. Rep. of Germany

Filed Apr. 19, 1976, Ser. No. 678,445

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1975, 2517743

Int. Cl.² C03C *3/04*

U.S. Cl. 106—52 **24 Claims**

1. Glass compositions useful for passivating silicon semiconductor elements which are applied on the surface of said semiconductor in the form of a finely ground powder and thereafter fused on at least a portion of said semiconductor element without any gap, said composition comprising: (A) glass capable of passivating semiconductor surfaces, in combination with (B) powdered cordierite in an amount effective to provide a coefficient of thermal expansion of up to 40×10^{-7}/° C. for said composition comprising (A) and (B) within the temperature range of 20°-300° C., whereby said compositions are compatible with the thermal expansion of said silicon semiconductor and capable of adhering to the silicon in layers of greater than 10 μm without the formation of cracks.

4,133,691

PROCESS FOR PREPARING INORGANIC FOAM MATERIALS

Lawrence J. Kindt, and James M. Gaidis, both of Ellicott City, Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Jan. 18, 1978, Ser. No. 870,273

Int. Cl.² C04B *21/02*

U.S. Cl. 106—75 **8 Claims**

1. A process for preparing an inorganic foam comprising:

mixing particulate metallic aluminum with an aqueous basic solution formed from a water soluble base selected from an alkali metal oxide, alkali metal hydroxide or alkali metal aluminate or mixtures thereof for a time sufficient to form an Al/base mixture and to initiate the formation of hydrogen therefrom; said aluminum and base being present in an amount to cause the formation of sufficient gas to produce said foam;

folding in the Al/base mixture into a separate aqueous alkali metal silicate solution at from about ambient temperatures to 40° C. and in a manner to substantially retain concentrated areas of said mixture in said silicate solution for a time to permit a substantial amount of hydrogen to be generated therein; and

recovering an inorganic foam, said foam having a silica to alumina molar ratio of from about 1:1 to 10:1.

4,133,692

PROCESS FOR MANUFACTURING IMITATION STONE USED FOR DECORATION

Mitchell D. Wright, Fox Bay Rd., Loris, S.C. 29569

Filed Jul. 21, 1977, Ser. No. 817,781

Int. Cl.² C04B *7/02*

U.S. Cl. 106—98 **8 Claims**

1. Process of manufacture of imitation stone used for decorative purposes in construction comprising mixing cement, sand and water in amounts to form a mix to provide a consistency of mortar mix that will hold a shape when shaped, preparing a non-adhering surface by laying a plurality of cords across the surface in which the cords are of a size and composition that may allow the mix when at least partially hardened to be lifted from the surface for forming imitation stone pieces, pouring a sheet of mortar mix into a determined random configuration shape and size by simply pouring the prepared mix onto said non-adhering surface, said cords being substantially disposed in parallel relation, and having ends to allow access to the cords, allowing the mix partially to dry and to set for a predetermined time, pulling loose accessible ends of the cords generally upward and away from the sheet of mix at approximately 45° when the cords seem to attempt to lift the entire sheet of mix up from the surface and breaking up the sheet of mix into random sized pieces caused by the continued step of pulling said cords.

4,133,693

PROCESS FOR PRODUCING CEMENT

Boris I. Nudelman, Chilanzar, kvartal 8, 27, kv. 48; Ilya Y. Simma, Trety Saperny proezd, 29a; Ida T. Uvarova-Nistratova, ulitsa Vrevskaya, proezd 2, 11; Vitaly I. Lisbaron, Chilanzar, kvartal 6, 2, kv. 9; Grigory I. Kalantarov, ulitsa Mukimi, 3, kv. 50, and Vakel K. Imangulov, Chilanzar, Pervy proezd Sun-Yat-Sena, 2, all of, Tashkent, U.S.S.R.

Filed Nov. 2, 1977, Ser. No. 847,925

Claims priority, application U.S.S.R., Jun. 10, 1977, 2486703

Int. Cl.² C04B *7/02*

U.S. Cl. 106—100 **1 Claim**

1. A process for producing cement comprising grinding a mixture of starting components containing calcium chloride, calcining the raw mixture at a temperature within the range of between 1,000 and 1,100° C to form a clinker; crushing said clinker at a temperature within the range of between 900 and 1,100° C; fractionating the crushed clinker at a temperature of from 1,00 to 1,100° C by a stream of fuel combustion products

at a speed of said stream of from 6 to 30 m/sec to produce two clinker fractions, said two fractions being a fraction with a particle size of 3 to 20 mm and a fraction with a particle size of 0.1 to 3 mm; separately desalting said clinker fractions at a temperature within the range of between 900 and 1,100° C by contacting said clinker fractions with a stream of fuel combustion products; cooling the desalted clinker, and grinding said cooled desalted clinker.

4,133,694

METHOD FOR REDUCING AGGREGATE SIZE

Orlando L. Bertorelli, Havre de Grace, and Robert C. Fitton, Bel Air, both of Md., assignors to J. M. Huber Corporation, Locust, N.J.

Continuation of Ser. No. 473,259, May 24, 1974, abandoned. This application May 3, 1976, Ser. No. 817,753

Int. Cl.² C09C *1/28*

U.S. Cl. 106—288 B **1 Claim**

1. A method of improving optical and paper properties of sodium alumino silicate pigments having transient structure comprising the steps of:

(a) forming a wet sodium alumino silicate filter cake slurry containing from 25% to 40% solids;

(b) adding glass microspheroids, having a diameter of from 1 to 2 mm and having a specific gravity from 2 to 3, to the wet filter cake slurry in an amount so that the ratio of glass microspheroids to slurry is from 1.2 – 1.8 : 1;

(c) agitating said wet filter cake slurry and glass microspheroids by stirring with a rotary stirrer for from 0.2 to 7.0 minutes at from 700 to 1250 RPM to reduce the structure of said sodium alumino silicate without significantly altering the particle size distribution; and

(d) screening said pigment/glass microspheroid mixture to separate said pigment from said glass microspheroids.

4,133,695

PIGMENT COMPOSITION

Ian R. Wheeler, Houston, and George H. Robertson, Paisley, both of Scotland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

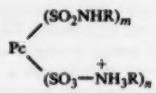
Filed Dec. 27, 1977, Ser. No. 865,064

Claims priority, application United Kingdom, Jan. 6, 1977, 338/77

Int. Cl.² C08K *5/34*

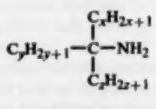
U.S. Cl. 106—288 Q **6 Claims**

1. A phthalocyanine pigment composition comprising a phthalocyanine pigment and a sulphonated phthalocyanine derivative of the formula:



I

wherein n is from 1 to 4, m is 0 to 3, the sum of m and n being from 1 to 4, both n and m representing the average number of groups per phthalocyanine nucleus in a given sample, and R is the alkyl residue of a primary amine having the general formula:



II

in which x, y and z are integers the sum of which is from 17 to 21.

4,133,696

SEPARATION OF SUGARS FROM MIXTURES

Sidney A. Barker; Peter J. Somers, and Robin R. Woodbury, all of Birmingham, England, assignors to Imperial Chemical Industries Limited, London, England

Filed May 24, 1977, Ser. No. 799,939

Claims priority, application United Kingdom, Jun. 16, 1976, 24928/76

Int. Cl.² C13D *3/14*; C13K *3/00*

U.S. Cl. 127—46 A **9 Claims**

1. A process for the separation of a sugar or a mixture of sugars from an ion-containing mixture comprising said sugar or mixture of sugars and oxyanions, said ion-containing mixture produced in a process for converting an aldose to a ketose in the presence of oxyanions, which comprises a step wherein the ion-containing mixture is contacted with:

(A) a cationic exchange resin having thereon divalent cationic counterions admixed with hydrogen ions; or

(B) a cationic exchange resin having thereon monovalent cationic counterions of which hydrogen ions, when present, form a minor proportion; or

(C) first with a cationic exchange resin having thereon counterions all or a major proportion of which are hydrogen ions and second with an anionic exchange resin having thereon monovalent or divalent anionic counterions.

4,133,697

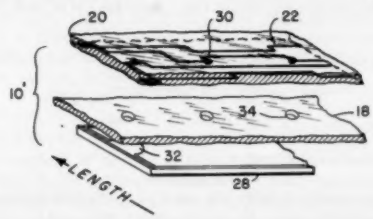
SOLAR ARRAY STRIP AND A METHOD FOR FORMING THE SAME

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Robert L. Mueller, Azusa, and Robert K. Yasui, Monterey Park, both of Calif.

Filed Jun. 24, 1977, Ser. No. 809,890

Int. Cl.² H01L *31/06*

U.S. Cl. 136—89 P **1 Claim**



1. An improved flexible solar array strip particularly suited for automated production comprising:

A. at least one pair of wrap-around contact solar cells arranged in juxtaposition, each cell of said pair having its contacts arranged in coplanar relation;

B. a flexible substrate for said pair of cells comprising an elongated strip consisting of a pair of layers of polyimide film bonded in superimposed relation, one layer of said pair comprising a base layer and one layer of the pair comprising a cover layer;

C. means defining a segmented printed circuit extended between the layers of film for electrically interconnecting said solar cells;

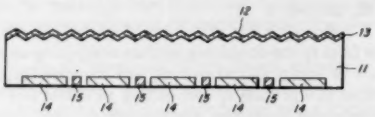
D. means defining in said cover layer a plurality of apertures disposed in registered relation with segments of the printed circuits, said segments being completely covered by said base layer; and

E. electrically conductive solder pads substantially filling said plurality of apertures for bonding the contacts of said solar cells to segments of said printed circuit, each contact being bonded through a separate aperture.

4,133,698
TANDEM JUNCTION SOLAR CELL

Shang-Yi Chiang, and Bernard G. Carbajal, both of Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 27, 1977, Ser. No. 864,283
Int. Cl.[2] H01L *31/06*
U.S. Cl. 136—89 SJ 7 Claims



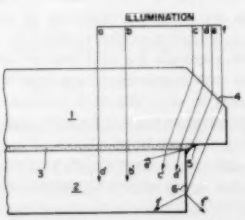
1. A solar cell comprising:
a. a semiconductor body predominantly of one conductivity type having substantially parallel opposite surfaces,
b. a first PN junction in said body, formed by a first region of opposite conductivity type extending along a major part of one of said surfaces, said one surface being substantially free of metallization, or other shadowing effect, thereby being adapted to receive incident radiation,
c. a second PN junction in said body, substantially parallel to said first junction, formed by second region of opposite conductivity type adjacent the opposite surface of said body, said junctions being electrically separate from each other, and spaced apart by a distance of no more than 150 micrometers, and
d. ohmic contacts to said second region and to a central portion of said body, respectively, on said opposite surface whereby said first junction is electrically floating and provides a charge field to supress front surface recombination and enhances collection at said second junction.

5. A cell as in claim 1 wherein said second region of opposite conductivity type is of fingered geometry, interdigitated with fingered contact regions to the central region of said body.

4,133,699
SHAPED EDGE SOLAR CELL COVERSLIDE

Andrew Meulenberg, Jr., Gaithersburg, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Apr. 26, 1978, Ser. No. 900,365
Int. Cl.[2] H01L *31/04*
U.S. Cl. 136—89 CC 6 Claims

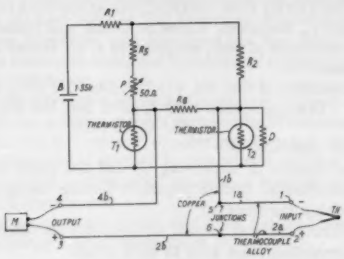


1. A solar cell having an overlying transparent coverslide, said coverslide having at least a length or width greater than a corresponding dimension of said solar cell such that a portion of said coverslide overhangs said solar cell and further characterized by an edge portion of said overhanging portion confirgured such that light perpendicular and incident upon said edge portion is directed toward the solar cell.

4,133,700
COLD JUNCTION THERMOCOUPLE COMPENSATOR

Betty R. Hollander, and William E. McKinley, Stamford, both of Conn., assignors to Omega Engineering Inc., Stamford, Conn.

Continuation of Ser. No. 665,582, Mar. 10, 1976, abandoned.
This application Dec. 21, 1977, Ser. No. 862,879
Claims priority, application United Kingdom, Mar. 13, 1975, 10478/75
Int. Cl.[2] H01L *35/28*
U.S. Cl. 73—361 1 Claim



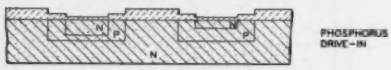
1. A cold junction compensator module comprising:
(i) an elongated housing having a first end and a second end and including a body portion;
(ii) a cold junction compensator circuit mounted on said body portion and including:
(a) a first input connector for connection to a first element of a sensing thermocouple, said first element being made of one material of a thermocouple junction, said first input connector being mounted at said first end of said body portion,
(b) a second input connector for connection to a second element of said sensing thermocouple, said second connector being made of said one material of said thermocouple junction, said second input connector being mounted at said first end of said body portion,
(c) a first copper conductor forming a thermocouple junction with said first connector,
(d) a second copper conductor forming a thermocouple with said second connector,
(e) first and second output terminals, mounted at said second end of said body portion,
(f) an electrical connection between said first conductor and said first output terminal,
(g) a Wheatstone bridge circuit including a supply battery, an arm of said bridge being constituted by matched Thermistors disposed in mutually balancing positions, said bridge circuit being arranged such that, over a range of temperature, it generates a voltage which at any temperature is equal and opposite to the voltage differential generated by said thermocouple junctions at that temperature, said bridge circuit being connected between said second conductor and said second output terminal,
(iii) a major cover extending from said first end of said body portion over a major part of the length of said body portion, said body portion and said major cover being apertured at said first end such that with said major cover secured on said body portion said input terminals are accessible from the exterior of the module,
(iv) a minor cover extending from said second end over a minor part of the length of said body portion, said minor cover covering said output terminals and preventing access thereto from the exterior of the module.

4,133,701

SELECTIVE ENHANCEMENT OF PHOSPHORUS DIFFUSION BY IMPLANTING HALOGEN IONS

Eugene Greenstein, Southfield, and Bernard A. MacIver, Lathrup Village, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 29, 1977, Ser. No. 810,929
Int. Cl.[2] H01L *21/263, 27/02*
U.S. Cl. 148—1.5 4 Claims



4. A method of making bipolar transistors with mutually different gain characteristics in a monolithic integrated circuit comprising the steps of:

identically depositing boron by ion implantation onto a plurality of discrete areas of an N-type silicon surface where bipolar transistors are to be formed;

masking a first plurality of said areas to isolate them from a halogen ion beam;

irradiating an unmasked second plurality of said areas with a halogen ion-containing beam in a dosage of at least 1×10^{15} ions per square centimeter effective to enhance phosphorus diffusion at said second plurality of areas, said halogen being a member selected from the group consisting of fluorine, chlorine and bromine, said irradiation implanting said halogen ions to a depth below said surface about as deep as boron ions enter said surface in said boron deposition;

diffusing the deposition boron simultaneously into said first and second areas to form transistor base regions of generally similar depths beneath said silicon surface;

identically depositing phosphorus onto said silicon surface within said first and second plurality of areas for providing bipolar transistor emitter regions within said base regions; and

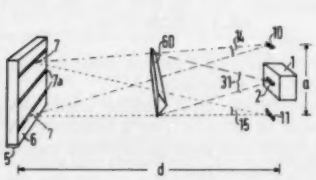
diffusing said phosphorus into said surface to form deeper emitter regions in said first plurality of areas than in said second plurality of areas, whereby bipolar transistors of narrower base width and higher gain are formed in said first plurality of areas than in said second plurality of areas.

4,133,702

METHOD OF PRODUCING STRUCTURED LAYERS ON A SUBSTRATE BEING IRRADIATED WITH TWO COHERENT PARTICLE BEAMS

Eberhard Krimmel, Pullach, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 11, 1977, Ser. No. 823,716
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1976, 2643893
Int. Cl.[2] H01L *7/54, 21/265*
U.S. Cl. 148—1.5 10 Claims



1. A method of producing a structured monocrystalline layer on a substrate comprising:

vapor-depositing a material onto a substrate surface from a source of said material;

substantially simultaneously irradiating said substrate surface with at least two coherent particle beams superposed in relation to one another, each beam having particles with an energy of more than about 10 keV; and

arranging said substrate surface in such a manner that the maxima of an interference pattern formed by said particle beams are located on said substrate surface.

4,133,703

PERMANENT MAGNETIC Mn-Al-C ALLOY

Shigeru Kojima, Kyoto; Kiyoshi Kojima, Katano, and Satoru Mitani, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Aug. 17, 1977, Ser. No. 825,459
Claims priority, application Japan, Aug. 27, 1976, 51-102934
Int. Cl.[2] H01F *1/04*
U.S. Cl. 148—31.57 3 Claims

1. In a permanent magnet comprising an Mn-Al-C alloy containing 68.0 to 73.0 wt.% of manganese, (1/10 Mn — 6.6) to (1/3 Mn — 22.2) wt% of carbon and the remainder aluminum, said alloy having been subjected to warm plastic deformation, the improvement wherein said alloy contains copper in an amount of 0.5 to 6.2 wt.% in order to improve the plasticity of said alloy.

4,133,704

METHOD OF FORMING DIODES BY AMORPHOUS IMPLANTATIONS AND CONCURRENT ANNEALING, MONOCRYSTALLINE RECONVERSION AND OXIDE PASSIVATION IN <100> N-TYPE SILICON

Bernard A. MacIver, Lathrup Village, and Eugene Greenstein, Southfield, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 17, 1977, Ser. No. 759,903
Int. Cl.[2] H01L *21/265*
U.S. Cl. 148—1.5 4 Claims

1. A method of making a silicon dioxide passivated PN junction by boron ion implantation on a <100> silicon crystal face that has a reverse current leakage as low as a silicon dioxide passivated diode made by boron ion implantation on a <111> silicon crystal face, said method comprising the steps of:

implanting boron ions into a selected region of an N-type <100> monocrystalline surface of at least about 1 ohm-centimeter resistivity silicon in a predetermined dose that converts said selected region from N-type doping to a preselected P-type doping;

irradiating said selected <100> surface region with electronically neutral atoms in a dosage sufficient to convert said selected <100> surface region from monocrystalline silicon amorphous silicon; and

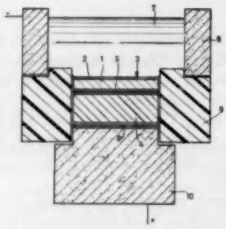
without intervening anneal in a neutral atmosphere, heating said silicon to at least about 900° C. for a predetermined time in a moist oxygen atmosphere to grow a silicon dioxide coating thereon to a preselected thickness of at least about 3,000 angstroms on said <100> surface and to concurrently anneal said region, whereby said amorphous silicon in said region is epitaxially reconverted to monocrystalline silicon, boron atoms are moved to substitutional crystal lattice sites in the silicon to form a P-type zone therein, and a low leakage silicon dioxide passivated PN junction is formed between said P-type zone and N-type contiguous portions of said silicon.

4,133,705

METHOD FOR THE EPITAXIAL DEPOSITION OF A SEMICONDUCTOR MATERIAL BY ELECTRICAL POLARIZATION OF A LIQUID PHASE AT CONSTANT TEMPERATURE

Elie André, Herouville, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 1, 1977, Ser. No. 812,262
Claims priority, application France, Jul. 9, 1976, 76 21107
Int. Cl.² H01L *21/208, 21/368*
U.S. Cl. 148—171 8 Claims



1. A method for the epitaxial deposition from a liquid phase, of a layer of semiconductor compound material on a substrate, comprising the steps of providing said substrate and said liquid phase in a space and applying electrical polarization between said solid and liquid in said space which is maintained at a constant and uniform temperature, said polarization being applied so that outside the growth time of said epitaxial deposit, the polarization is in the direction which causes a cooling by the Peltier effect and with a current density which is lower than the threshold level which causes the growth of said epitaxial deposit.

4,133,706

PROPELLANTS CONTAINING CARBORANYLMETHYL ALKYL SULFIDE PLASTICIZERS

Royland D. Shoults, Fayetteville, N.C., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 3, 1972, Ser. No. 293,256
Int. Cl.² C06D *5/06*
U.S. Cl. 149—19.4 10 Claims

1. A propellant composition comprising a binder selected from the group consisting of hydroxy terminated polybutadiene, carboxy terminated polybutadiene, and polybutadiene-acrylic acid copolymer; ammonium perchlorate oxidizer; aluminum metal; a crosslinking agent selected from the group consisting of toluene diisocyanate, epoxy resins, and tris[1-(2-methyl)-aziridinyl]phosphine oxide, said crosslinking agent selected being a crosslinking agent that is reactive with said binder selected; and a carboranylmethyl alkyl sulfide plasticizer selected from the group consisting of carboranylmethyl ethyl sulfide, carboranylmethyl n-propyl sulfide, carboranylmethyl iso-propyl sulfide, carboranylmethyl n-butyl sulfide, carboranylmethyl iso-butyl sulfide, and mixtures of said carboranylmethyl alkyl sulfides.

4,133,707

PRIMING MIX WITH MINIMUM VISCOSITY CHANGE

Eugene A. Andrew, Florissant, Mo., assignor to Olin Corporation, New Haven, Conn.

Filed Nov. 14, 1977, Ser. No. 850,882
Int. Cl.² C06B *41/06*
U.S. Cl. 149—28 6 Claims

1. A water-bearing extrudable explosive primer mix having improved rheological stability comprising:

(a) about from 25 to 60% lead styphnate,
(b) about from 1 to 10% tetracene,
(c) about from 0 to 10% pentaerythritol tetranitrate (PETN),
(d) about from 20 to 60% barium nitrate,
(e) about from 0 to 25% antimony sulfide,
(f) about from 0 to 10% aluminum,
(g) an amount of water effective to reduce said mix to an extrudable consistancy, and
(h) an amount of guar gum effective to substantially stabilize the consistancy of said extrudable mix.

4,133,708

METHOD FOR PRODUCING A FISHING-ROD

Tomotoshi Tokuno, 15-20, Shingashi 1-chome, Itabashi-ku, Tokyo, Japan

Filed Sep. 20, 1976, Ser. No. 725,124
Claims priority, application Japan, Sep. 25, 1975, 50/114841
Int. Cl.² B32B *27/04;* A01K *87/00;* B32B *05/12*
U.S. Cl. 156—179 7 Claims

1. A method for producing a fishing-rod comprising the steps of:

providing at least one piece of longitudinally symmetrical trapezoidal glass fiber fabric impregnated with liquid thermosetting plastic and having warp and weft yarns intersecting each other at a 45° angle with respect to the longitudinal center line of said fabric;

winding said trapezoidal glass fiber fabric about a tapered mandrel with the narrower end portion of said fabric directed toward the reduced diameter end portion of said mandrel;

at the same time as the winding of said fabric, interposing at least one bundle of long carbon fibers having substantially the same length as said glass fiber fabric and which is impregnated with the same thermosetting plastic that impregnates said glass fiber fabric between adjacent turns of said glass fiber fabric and covers a distance in the transverse direction of said fabric and extends in the longitudinal direction of said mandrel;

heating the thus-obtained assembly to set said thermosetting plastic to thereby integrally unite the glass fiber fabric and carbon fibers together into a unitary structure; and

removing said mandrel from said unitary structure.

4,133,709

METHOD OF MAKING FLEXIBLE MULTI-COLUMNAR FLUID TREATMENT CELLULAR APPARATUS

Arnold J. Carrico, 930 Pinto Ct., Walnut Creek, Calif. 94596

Division of Ser. No. 777,567, Mar. 14, 1977, Pat. No. 4,117,049.
This application Nov. 16, 1977, Ser. No. 851,977
Int. Cl.² B32B *7/14*
U.S. Cl. 156—197 3 Claims

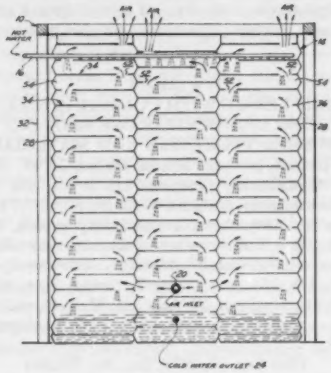
1. A method of making a flexible columnar cellular fluid treatment apparatus, comprising

forming from flexible sheet material coated on one side thereof with an adhesive layer a multiplicity of pairs of partition sheets with ports therethrough disposed at predetermined locations therein,

arranging and securing said partition sheets of each pair to one another in predetermined orientations and dispositions relatively to one another to position the ports thereof at predetermined locations therein to form multiple partition walls,

assembling a multiplicity of said partition walls in a stack thereof in parallel relationship,

encircling the stack of said partition walls with accordion-folded adhesive-coated side walls,



and pressing said adhesive-coated side walls against the edge portions of said partition walls into uniting sealing engagement therewith.

4,133,710

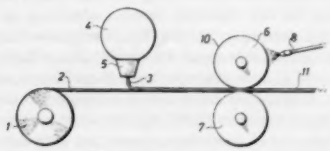
METHOD FOR FORMING A POLYETHYLENE LAYER ON A SUBSTRATE

Erwin W. Wartenberg, Stuttgart, Fed. Rep. of Germany, assignor to Cordotex SA, Lausanne, Switzerland

Continuation-in-part of Ser. No. 542,877, Jan. 21, 1975, abandoned. This application Mar. 16, 1977, Ser. No. 778,192

Int. Cl.[2] B29F *3/08*

U.S. Cl. 156—244.27 **7 Claims**



1. A process for the coating of a substrate, consisting of paper or paper lined with a metal foil, with polyethylene in which the polyethylene is extruded to a thin film which, while it is still warm, is brought into contact with the substrate and, with simultaneous cooling to a temperature below the softening temperature of the polyethylene, is pressed together with the substrate by passing the substrate and the extruded polyethylene film through cooperating rolls wherein at least one roll which is brought into contact with the polyethylene coating is a metal chill roll which is moistened on its rolling surface with a liquid having a critical surface tension below 73 dyne/cm and a boiling point below 100° C., and consisting of a mixture of water and between about 10% and about 50% ethyl alcohol, whereby an uninterrupted liquid layer is applied to the whole contact surface of the roll or rolls with the polyethylene coating.

4,133,711

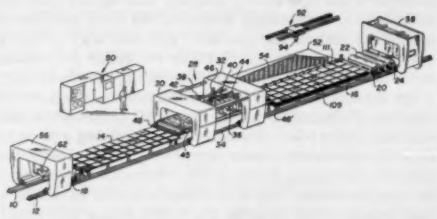
AUTOMATED INTEGRATED COMPOSITE LAMINATION SYSTEM

Arthur August, Smithtown, and John G. Huber, Sayville, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jul. 11, 1977, Ser. No. 814,472

Int. Cl.[2] B29D *5/20*; B32B *35/00*

U.S. Cl. 156—353 **28 Claims**



1. An automated, integrated composite laminating production line comprising:

parallel rail means of a predetermined length;

a taping gantry controllably moveable along said rail means, said gantry mounting a tape head;

a first work table within said rail means and oriented to said tape gantry to receive tape therefrom in composite lamination of a tape from said tape head;

a second work table spaced from said first work table within said rail means said second work table having a pivotal surface;

a transfer gantry controllably moveable along said rail means;

a means supported by said transfer gantry to transfer product from said first work table to said second work table;

a mold form adjacent said second work table;

a cutting gantry controllably moveable along said rail means;

cutting means supported by said cutting gantry to size the composite lamination on said second work table, said pivotal surface of said second work table cooperating with said cutting means; and

control means to move the tape, transfer and cutting gantries and operate the pivoting surface.

4,133,712

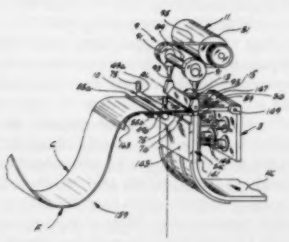
APPARATUS FOR AND METHOD OF FORMING HONEYCOMB MATERIAL

Robert C. Geschwender, Lincoln, Nebr., assignor to Lancaster Research & Development Corp., Lincoln, Nebr.

Continuation of Ser. No. 551,056, Feb. 19, 1975, abandoned. This application Jan. 31, 1977, Ser. No. 764,269

Int. Cl.[2] B32B *31/00*; B65H *17/22*

U.S. Cl. 156—512 **2 Claims**



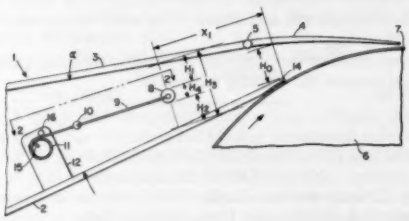
1. Apparatus for forming honeycomb material comprising: means for securing together an even numbered plurality of

superimposed webs of flexible sheet material to form a composite web by forming adhesive lines between opposite web faces extending longitudinally of the webs and spaced transversely across the webs and by forming adhesive stripes on one outside face of the composite web; feed means engaging the composite web for advancing a predetermined length of composite web past a reference line during an advancing phase and for arresting the movement of the predetermined length during a dwell phase; the feed means comprising at least one web advancing roller engaging a side of the web, a continuously rotating drive member, a link operatively coupled with the drive member for transforming the rotating motion of the drive member into an oscillating motion for the link, and one way clutch means operatively coupling the link and the roller for rotating the roller through an angle of rotation during the advancing phase when the link oscillates in one direction and for arresting the rotation of the roller during the dwell phase when the linke oscillates in the other direction; means defining a pivot axis for the link; adjustment means operatively coupled with the feed means for changing during normal operation of the feed means the predetermined length of composite web advanced by the feed means which includes crank arm means connected with the clutch means, bar means pivotally secured to the link and crank arm means, and means operatively connected with the link and the bar means for changing the distance between the pivot axis and the point at which the bar means is pivotally connected to the link to cause a corresponding change in the angle through which the roller is rotated; means for severing the predetermined length of composite web along the reference line during the dwell phase to form composite web segments; and means for stacking the segment so that the segments are secured to each other by the adhesive stripes.

4,133,713
MICROTURBULENCE GENERATOR FOR PAPERMACHINE HEADBOX

Strong C. Chuang, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 11, 1977, Ser. No. 841,494
Int. Cl.² D21F *1/02*
U.S. Cl. 162—216 **14 Claims**



12. A method for forming a moist paper web exhibiting improved formation characteristics, improved fiber dispersion and randomized fiber orientation without undesirable surface disruptions at papermachine speeds of about 800 feet per minute or greater, said method comprising:

(a) introducing macroturbulent flow to a dilute aqueous slurry of papermaking fibers upon introduction to a convergent papermachine headbox flow channel;

(b) directing said macroturblent flow of papermaking fibers toward the throat of said flow channel at an angle of convergence between about 4° and about 20°;

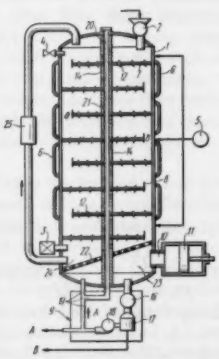
(c) introducing microturblence to said macroturbulent flow of papermaking fibers within said headbox flow channel by first constricting and then momentarily expanding the flow of said papermaking fibers at a point between about 1 and about 10 inches upstream of the throat of said headbox flow channel, said point being sufficiently near the throat of said headbox flow channel that the microturbulence remaining in the discharge jet minimizes flocculation and promotes dispersion and random orientation of said papermaking fibers; and

(d) discharging said flow of papermaking fibers through said headbox throat in the form of a jet to form a moist paper web on a traveling foraminous support member.

4,133,714
REACTION VESSEL WITH PULSATING MEANS FOR PRODUCING LIGNOCELLULOSE PRODUCT FROM CRUSHED VEGETABLE RAW MATERIALS

Jury P. Vorobiev, prospekt Morisa Toreza, 26, kv. 35; Jury S. Ivanov, Grazhdansky prospekt, 126/3, kv. 104; Lazar O. Ioffe, Grazhdansky prospekt, 87/2, kv. 57, all of Leningrad; Susanna M. Karpacheva, 2 Schukinsky proezd, 2, kv. 88, Moscow; Irina S. Kukurechenko, Chekhovskay ulitsa, 3, kv. 11, Moscow; Valerian M. Muratov, Astakhovsky perulok, 1/2, kv. 118, Moscow; Viktor P. Serebryakov, ulitsa Marshala Tukhachevskogo, 21/1, kv. 12, Moscow, and Viktor A. Shiyanov, Olginskaya ulitsa, 6, kv. 24, Leningrad, all of U.S.S.R.

Filed Sep. 15, 1976, Ser. No. 723,602
Claims priority, application U.S.S.R., Oct. 3, 1975, 2173766
Int. Cl.² D21C *7/00, 7/10, 7/14*
U.S. Cl. 162—237 **16 Claims**



1. In an apparatus for producing a product from raw materials, a hollow reaction vessel in the form of a vertical column, a plurality of means communicating with said vessel for respectively feeding the raw materials thereto, admitting an oxygen-containing gas thereto, supplying liquid reagents thereto, discharging therefrom an output which includes a final product and liquor, and discharging spent gas therefrom, a tube connected to and communicating with the interior of said vessel and extending outwardly therefrom, a pulsator means at the exterior of said vessel operatively connected with said tube for providing through the latter pulses which set liquid reagents in said column into reciprocating vertical motion, and a plurality of substantially horizontal plates situated in said hollow reaction vessel and being spaced from each other while distributed vertically along the interior of said reaction vessel, each plate having a peripheral edge engaging an inner surface of said vessel, and each plate being formed with a plurality of openings passing therethrough and having at least at some of said openings thereof, respectively, a plurality of guide vane means respectively in line with said openings and inclined at an acute angle with respect to said plate for setting said liquid reagents into horizontal motion, so that the liquid reagents set into said vertical reciprocating motion by said pulsator means and tube will upon passing through said plate openings where said vane means are located be directed by said vane means to move substantially horizontally with respect to said plates, said pulsator means and said guide vane means thus subjecting said liquid reagents both to vertical and horizontal movement in

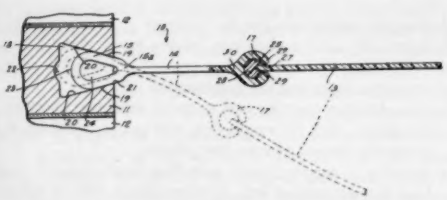
said vessel without requiring the use of moving components in the interior of said vessel, said reaction vessel having opposed upper and lower end regions, and fractionating means extending across the interior of said vessel at one of said end regions thereof and dividing said one end region into an inner zone communicating with said plates and an outer zone separated by said fractionating means from said plates, said fractionating means permitting only relatively fine particles to reach said outer zone while retaining coarse particles at said inner zone, and transporting means communicating with said inner zone and with the other of said end regions for transporting the coarse particles from said inner zone to said other end region so that the coarse particles are recirculated through said vessel until they are fine enough to pass through said fractionating means to said outer zone, said tube communicating with said vessel at said outer zone so that the pulsations are delivered from said pulsator means through said tube into said outer zone, with said pulsator means also contributing by said pulsations to maintaining said fractionating means unclogged, said means for discharging said output communicating with said outer zone.

4,133,715

HEADBOX AND HOLDERS FOR FLOATING SLICE CHAMBER DIVIDERS

Richard E. Hergert, Rockton, Ill., assignor to Beloit Corporation, Beloit, Wis.

Filed Mar. 29, 1977, Ser. No. 782,498
Int. Cl.[2] D21F *1/02*
U.S. Cl. 162—341 **23 Claims**



1. In a headbox structure for delivering papermaking stock to a forming surface of a papermaking machine wherein a slice chamber has a receiving end across which extends a perforated headbox plate through which stock is supplied into the slice chamber for movement through the slice chamber to a slice opening from which the stock is delivered to a papermaking machine forming surface:

a holder formed from plastic material of high resistance to bending fatigue and anchoring a channel dividing sheet element to said plate to extend in substantially free floating rotation downstream within the slice chamber toward the slice opening;

said holder having a resiliently flexible body of substantial length between opposite end edges;

base means integrally along one edge of said body and in anchored attachment to said plate;

and means integrally along the opposite edge of the holder body and in holding attachment to the upstream end of the sheet element;

said body being of about the same thickness as the thickness of said sheet element and flexible substantially throughout its length between said edges and substantially relieving the attached end portion of the divider sheet element from flexure fatigue.

4,133,716

METHOD FOR THE BIOSYNTHESIS OF A MICROBIAL INSECTICIDE

Branimir Zamola, Chiasso, and Franjo Kajfez, Lugano, both of Switzerland, assignors to CRC Compagnia Ricerca Chimca, S.A., Chiasso, Switzerland

Filed Nov. 22, 1976, Ser. No. 744,102
Int. Cl.[2] C12J *5/00*; C12B *1/08*; A01N *15/00*
U.S. Cl. 195—96 **2 Claims**

1. A method for the biosynthesis of a microbial insecticide containing spores and crystalline endotoxin, which comprises cultivating, by submerged cultivation, a Bacillus thuringiensis microoganism in a nutrient medium under formation of spores and preventing, by anaerobic shock, early lysis of the cells resulting during the course of the submerged cultivation by ventilation prior to the completion of spore formation.

4,133,717

PROTEIN-FREE NUTRIENT MEDIUM

Russell C. Johnson, and Russell F. Bey, both of Roseville, Minn., assignors to The Regents of the University of Minnesota, Minneapolis, Minn.

Filed Aug. 1, 1977, Ser. No. 820,737
Int. Cl.[2] C12K *1/10*
U.S. Cl. 195—100 **13 Claims**

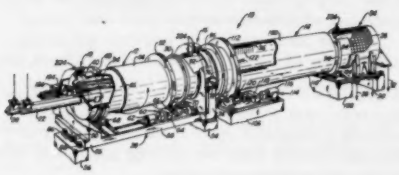
1. A protein-free nutrient medium, suitable for culture growth of Leptospira organisms, which comprises an aqueous solution of a buffer, mineral salts, vitamins and a detoxified charcoal treated polysorbate, said polysorbate being detoxified by admixture in aqueous solution with activated charcoal, followed by separation of the charcoal.

4,133,718

METHOD FOR AGGLOMERATING FINELY DIVIDED AGGLOMERATIVE MATERIALS IN A ROTARY DRUM ASSEMBLY

Louis H. Jaquay, Pittsburgh, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 687,104, May 17, 1976, abandoned.
This application Jun. 23, 1977, Ser. No. 809,370
Int. Cl.[2] C10B *45/02*; B01J *2/12*
U.S. Cl. 201—6 **7 Claims**



1. A method for forming an agglomerated product from agglomerative material comprising,

feeding substantially dry finely divided agglomerative materials into the inlet portion of a first drum member, at least one of said materials being at an elevated temperature to supply sensible heat during agglomeration and another of said materials capable of evolving a fluid binder to agglomerate said materials into a loosely coherent plastic mass,

rotating said first drum member to intimately mix said finely divided agglomerative materials in said first drum member in a manner that one of said materials heats the other of said materials to evolve the fluid binder and form a loosely coherent plastic mass therefrom while moving said agglomerative materials from said first drum inlet portion toward the first drum outlet portion,

controlling the speed of rotation of said first drum member to thereby control the rate of mixing of said agglomerative materials while forming said loosely coherent plastic mass,

rotating said first drum member to agglomerate said loosely coherent plastic mass into discrete agglomerates,

regulating the slope of said first drum member to control the residence time of said discrete agglomerates in said first drum member,

directly transferring the discrete agglomerates of said loosely coherent plastic mass from said first drum member outlet portion into the inlet portion of a hardening drum member,

rotating said hardening drum to rigidify and harden said agglomerates in said hardening drum member and forming relatively hard rigidified agglomerates, and

rotating said hardening drum to convey said agglomerates from said hardening drum inlet portion to said hardening drum discharge portion, discharging said relatively hard rigidified agglomerates from the discharge portion of said hardening drum member.

4,133,719

PROCESS AND APPARATUS FOR CHARGING INCLINED CHAMBER COKE OVEN

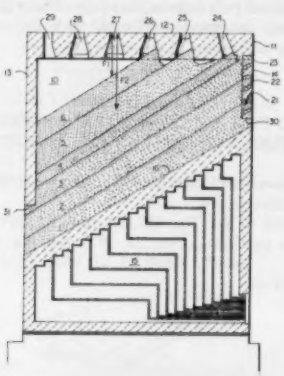
Dietrich Wagener, Essen, Germany, assignor to Didier Engineering GmbH, Essen, Germany

Filed Dec. 17, 1976, Ser. No. 751,707

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1975, 2559118

Int. Cl.[2] C10B *57/00, 31/02;* B65G *3/00*

U.S. Cl. 201—40 **1 Claim**



1. A process for filling a coke oven chamber of an inclined chamber coke oven of the type having a heating side, a coke removal side, a horizontal chamber ceiling and a chamber floor inclined downwardly from said heating side to said coke removal side, said process comprising:

supplying material, in the form of briquettes to be formed into coke during a coking operation, into said chamber through charging holes arranged vertically one above the other in a front wall of said oven at said heating side and one after the other in said chamber ceiling in a direction from said heating side to said coke removal side, said briquettes being supplied in separate charging operations through separate of said charging holes in a sequence from a lowermost charging hole to an uppermost charging hole in said front wall and then from one of said chamber ceiling charging holes closest adjacent said heating side to one of said chamber ceiling charging holes closest adjacent said coke removal side, said charging operations forming separate inclined fill layers arranged sequentially one on top of the other, each of said fill layers being formed to a height so that it is spaced vertically below the next succeeding charging hole in the charging sequence by a distance less than that which would cause breakage of said briquettes dropping to said layer from said next succeeding charging hole in the charging sequence.

4,133,720

SUPPORT APPARATUS FOR A BATTERY OF UNDERJET COKE OVENS

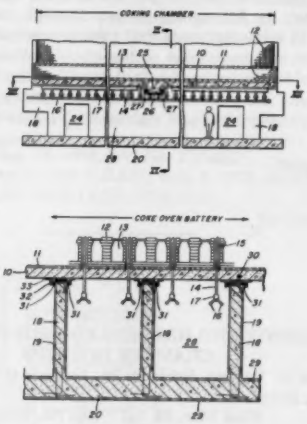
Wolfgang Franzer, Bochum-Wattenscheid, and Hans J. Adamus, Essen, both of Fed. Rep. of Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Fed. Rep. of Germany

Filed Sep. 28, 1977, Ser. No. 837,347

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1976, 2647743

Int. Cl.[2] C10B *1/06, 1/00;* E04B *1/60*

U.S. Cl. 202—223 **2 Claims**



1. Support apparatus for an underjet coke oven battery which includes coking chambers having longitudinal heating walls with flues therein receiving gaseous combustion media, said apparatus including the combination of:

battery decking carrying said underjet coke oven battery,

a foundation slab for supporting said battery decking at a vertically-spaced relation thereabove,

a plurality of support walls including reinforcement members therein bonded into said foundation slab to support said battery decking while forming a cellar, said cellar including gas distribution ducts for said gaseous combustion media, the top surfaces of said support walls including recesses along the center line of said underjet coke oven battery,

sliding joints including slip plates between said support walls and said battery decking to permit relative movement therebetween due to thermal expansion,

studs extending downwardly from the battery decking into said recesses in the support walls along the center line of the underjet coke oven battery to absorb horizontal forces imposed on said battery decking when pushing coke from said coking chambers,

dampers below said battery decking engaged between said studs and the vertical surfaces of said recesses in the support walls for acting parallel to the heating walls of the coking chambers,

strip members extending downwardly from the underside of said battery decking along the sides of said support walls while spaced therefrom, and

dampers below said battery decking engaged between said strip members and the top portion of the two longitudinal sides of at least part of said support walls for acting in a direction normal to the longitudinal heating walls of said coking chambers.

4,133,721

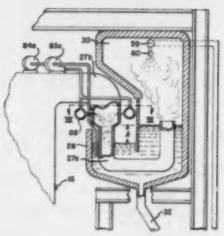
TRAVELING HOOD FOR COKE OVEN EMISSION CONTROL

Roy Naevestad, Fanwood, N.J., assignor to Wilputte Corporation, New Providence, N.J.

Continuation-in-part of Ser. No. 730,075, Oct. 6, 1976, abandoned. This application Jul. 25, 1977, Ser. No. 818,935

Int. Cl.[2] C10B *27/00, 27/06, 45/00*

U.S. Cl. 202—263 **4 Claims**



1. The combination of a coke oven battery having a plurality of coke ovens in side-by-side relation, a track paralleling the coke oven battery on the coke side and a quench car traveling on said track into which hot coke is pushed selectively from the coke ovens of said coke oven battery, a hood traveling on a track, suspended over the quench car, and movable into close overhead registry therewith, an exhaust duct paralleling and coextensive in length with the cokeoven battery, said exhaust duct comprising water trough means which is coextensive to said exhaust duct, wherein the improvement comprises a lateral U-shaped extension duct on said hood through which emissions collected in said hood flow to the exhaust duct, said U-shaped extension duct comprising an upstream section and a downstream section, the downstream section being smaller in cross-sectional area than the upstream section and providing a venture-like restriction to flow of emissions from the said hood to said exhaust duct across which a pressure differential exists, and a water pressure system including a series of nozzles in the upstream section of said U-shaped extension duct for laterally projecting a spray of water into the flow of emissions immediately in advance of the restriction provided by said downstream section, to effect a blending of said spray with said emissions to produce a cooling and a cleaning of said emissions prior to entry into said exhaust duct.

4,133,722

PROCESS FOR DETERMINING PROPERTIES OF MATERIALS

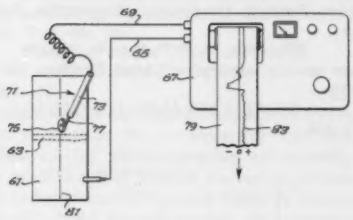
Minas Ensanian, P.O. Box 98, Eldred, Pa. 16731

Continuation-in-part of Ser. No. 754,571, Dec. 27, 1976, abandoned, which is a division of Ser. No. 574,360, May 5, 1975, Pat. No. 4,006,063, which is a continuation of Ser. No. 79,033, Oct. 8, 1970, abandoned. This application Feb. 4, 1977, Ser. No. 765,648

Int. Cl.[2] G01N *27/46;* **G01B** *7/16*

U.S. Cl. 204—1 T **27 Claims**

1. A process for measuring information encoded in a manufactured, electrically conductive product in which said product serves as an electrode in a system which includes a solid electrolyte and a second electrode which comprises the steps of repeatedly scanning said product by use of a second electrode and a rollable member which comprises a solid electrolyte, in each of which scans the material of at least one of said second electrode and said electrolyte is different, and record-



ing the mechanogalvanic potentials at selected points along the paths of the scans.

4,133,723

ACTINIC RADIATION-CURABLE FORMULATIONS FROM THE REACTION PRODUCT OF ORGANIC ISOCYANATE, POLY(ALKYLENE OXIDE) POLYOL AND AN UNSATURATED ADDITION-POLYMERIZABLE MONOMERIC COMPOUND HAVING A SINGLE ISOCYANATE-REACTIVE HYDROGEN GROUP

Dennis K. Howard, Girard, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Jan. 3, 1978, Ser. No. 866,575

Int. Cl.[2] C08F *8/00;* **C08G** *18/34, 18/04*

U.S. Cl. 204—15 **33 Claims**

1. A coating composition comprising

(A) at least one unsaturated urethane resin comprising the reaction product of

(i) at least one organic isocyanate compound having at least two isocyanate groups;

(ii) at least one poly(alkylene oxide) polyol, said polyol having from 1 to 9 carbon atoms in the alkylene group separating each pair of oxygen atoms, and

(iii) at least one unsaturated addition-polymerizable monomeric compound having a single isocyanate-reactive active hydrogen group;

there being present an excess of isocyanate compound with respect to the hydroxyl groups of said poly(alkylene oxide) polyol;

said unsaturated addition-polymerizable monomeric compound having a single isocyanate-reactive active hydrogen group being present in an amount sufficient to provide at least one molar equivalent of active hydrogen group with respect to isocyanate reactivity;

B) A reactive diluent system comprising at least one unsaturated addition-polymerizable monomeric compound which is copolymerizable with said unsaturated urethane resin;

the amount of unsaturated urethane resin being in the range from about 30 to about 90 weight percent, based on total weight of unsaturated urethane resin and reactive diluent system;

(C) At least one aromatic ketone or aromatic aldehyde photosensitizer which promotes photopolymerization through bimolecular photochemical reactions of the energy donor type or hydrogen abstraction type; and

(D) At least one aromatic ketone photoinitiator which generates a radical pair by way of unimolecular homolysis resulting from photoexcitation.

4,133,724

ANODIZING A COMPOUND SEMICONDUCTOR

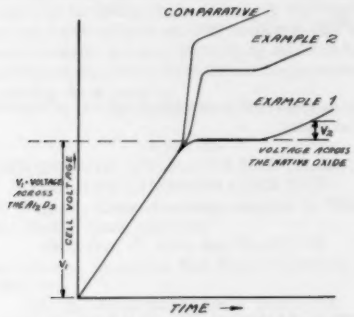
Hans L. Hartnagel; Stephen J. Hannah, and Burhan Bayraktaroglu, all of Newcastle-upon-Tyne, England, assignors to National Research Development Corporation, London, England

Filed Nov. 30, 1977, Ser. No. 856,094

Claims priority, application United Kingdom, Dec. 7, 1976, 51016/76

Int. Cl.[2] C25D *11/04, 11/32, 11/34*

U.S. Cl. 204—38 A 12 Claims



1. A method of anodising a compound semiconductor, comprising

(1) plating a metal on the compound semiconductor,

(2) contacting the exposed surface of the metal with an electrolyte which permits anodic oxidation of the metal, and

(3) passing an electric current through the electrolyte with the exposed surface of the metal acting as an anode, the current density not exceeding 100 microamps per square centimeter of the surface and the quantity of current being more than sufficient to oxidise anodically all the metal.

4,133,725

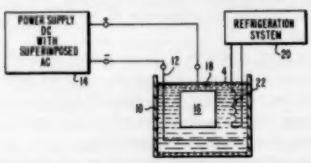
LOW VOLTAGE HARD ANODIZING PROCESS

Moisey M. Lerner, Brookline, and James H. Morse, Holliston, both of Mass., assignors to Sanford Process Corporation, Natick, Mass.

Filed May 18, 1978, Ser. No. 906,921

Int. Cl.[2] C25D *11/04*

U.S. Cl. 204—58 17 Claims



1. A method for hard anodizing aluminum and aluminum alloy articles comprising the steps of:

immersing one or more of said articles in a cooled electrolyte composed of an aqueous solution of a strong acid;

applying for a predetermined time interval across said article and a cathode in said electrolyte a DC voltage with a superimposed AC voltage, the positive potential of the DC voltage component being applied to said article and the negative potential of the DC voltage component being applied to said cathode;

said DC voltage component having a value during at least a portion of said time interval substantially in the range of about 14–20 volts, said value being the highest DC voltage applied during said time interval to said articles.

4,133,726

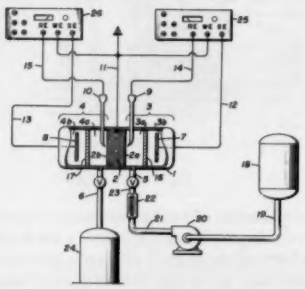
ELECTROLYTIC FLOW-CELL APPARATUS AND PROCESS FOR EFFECTING SEQUENTIAL ELECTROCHEMICAL REACTION

John H. Wagenknecht, Kirkwood, Mo., and Dean G. Laurin, Mt. Prospect, Ill., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 755,312, Dec. 29, 1976, Pat. No. 4,071,429. This application Sep. 23, 1977, Ser. No. 836,444

Int. Cl.[2] C25B *3/02, 3/04, 11/00*

U.S. Cl. 204—59 R 25 Claims



1. A process for effecting sequential electrochemical reactions of redoxidative organic compounds at a porous working electrode having a first face and a second and opposite face, which process comprises:

(a) electrolyzing a liquid electrolysis medium containing such redoxidative organic compound, solvent, and supporting electrolyte at the first face of the working electrode, which face is maintained at a selectible electrical potential;

(b) effecting the flow of the electrolysis medium through the working electrode;

(c) electrolyzing the electrolysis medium at the second and opposite face of the working electrode, which face is independently maintained at a selectible electrical potential; and

(d) recovering a sequentially electrolyzed product of such redoxidative organic compound.

4,133,727

METHOD FOR EXTRACTING HEAT FROM A CHAMBER CONTAINING A MOLTEN SALT

Elmer H. Rogers, Jr., Palestine, Tex., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed May 17, 1977, Ser. No. 797,747

Int. Cl.[2] C25C *3/00, 3/02, 3/06*

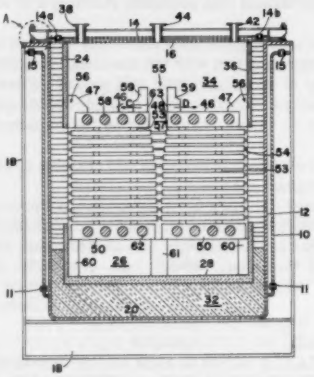
U.S. Cl. 204—67 9 Claims

1. A method for extracting heat from a chamber containing a molten salt bath, said chamber being an electrolysis cell, comprising:

providing a portion on the chamber, said portion having a surface bordering directly on a gas space above the bath, which gas space contains constituents spewed and/or evaporated from the bath; and

providing a cooling means on said portion for maintaining

said surface at a temperature at least 200° C. below the temperature of the bath and above the freezing point of



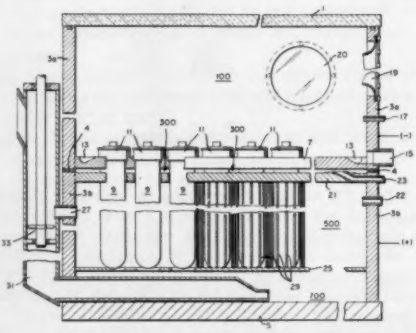
said constituents, whereby said constituents can deposit on said surface in liquid form and drop back into the bath.

4,133,728

ELECTROLYTIC CELL WITH SWITCHING MEANS

Steven A. Cope, North Little Rock, Ark., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 26, 1978, Ser. No. 872,667
Int. Cl.[2] C25C *3/02, 3/08*
U.S. Cl. 204—68 **7 Claims**



6. A method of initiating production of molten alkali metal from an electrodissociatable compound in an electrolyte cell employing a solid electrolyte tube as a diaphragm to separate an anode compartment from a cathode compartment comprising: (1) adding molten alkali metal to the inside of the tube, (2) establishing a temporary electrical path from a cathodic element of the cell to the molten alkali metal in the tube, (3) electrolyzing the compound to produce alkali metal in the tube at an increasing level therein until the alkali metal establishes direct contact with the cathodic element and (4) removing the temporary electrical path.

4,133,729

PRODUCTION OF 1,2-BIS(HYDROXY-PHENYL)ETHANE-1,2-DIOLS BY ELECTROLYTIC REDUCTION

Christopher J. H. King, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 19, 1977, Ser. No. 861,793
Int. Cl.[2] C25B *3/04*
U.S. Cl. 204—75 **13 Claims**

1. A process for the electrolytic reduction of hydroxybenzaldehydes to produce the corresponding 1,2-bis(hydroxyphenyl)ethane-1,2-diol which comprises electrolyzing in an undivided reaction cell an aqueous electrolyte solution comprising the hydroxybenzaldehyde at a weight % concentration of about 2–10% of the aqueous solution, the aqueous solution being at a pH of about 10.5–14 and in contact with a cathodic surface having a cathode potential sufficient for electrolytic reduction of the hydroxybenzaldehyde, purging the aqueous solution, and recovering the 1,2-bis(hydroxyphenyl)ethane-1,2-diol by extracting with an aldehyde precipitant, leaving a product extraction residue suitable for continued use as an essential portion of the electrolyte solution.

4,133,730

ELECTROLYSIS OF BRINE USING TITANIUM ALLOY ELECTRODE

Donald W. Du Bois, and William B. Darlington, both of Corpus Christi, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 694,506, Jun. 9, 1976, Pat. No. 4,075,070. This application Sep. 16, 1977, Ser. No. 833,929
Int. Cl.[2] C25B *1/02, 1/14, 11/10*
U.S. Cl. 204—98 **19 Claims**

1. In a method of electrolysis of alkali metal chloride brines where an electrical current is passed from a first electrode through an electrolyte to a second electrode whereby to evolve product at said electrodes, the improvement wherin one of said electrodes comprises an alloy of titanium and a rare earth metal chosen from the group consisting of scandium, yttrium, and the lanthanides, said rare earth metal being present at a high enough level to diminish hydrogen uptake by the titanium but at a low enough level to avoid substantial formation of a two-phase system.

4,133,731

RADIATION CURED, HIGH TEMPERATURE ADHESIVE COMPOSITION

David R. Hansen, and David J. St. Clair, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 3, 1978, Ser. No. 883,118
Int. Cl.[2] C08F *8/00*
U.S. Cl. 204—159.17 **12 Claims**

1. An adhesive composition possessing good solvent resistance and high temperature cohesive strength prepared by the radiation curing of an adhesive composition in an inert atmosphere, said adhesive composition comprising:

(a) 100 parts by weight of a block copolymer having at least two monoalkenyl arene polymer end blocks A and at least one elastomeric conjugated diene mid block B, said block A comprising 8–55% by weight of the block copolymer;

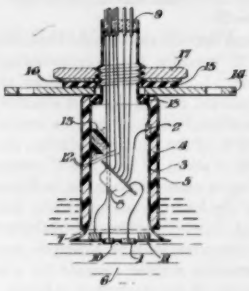
(b) about 25 to about 200 parts by weight of a tackifying resin compatible with block B; and

(c) about 1 to about 50 parts by weight of a di-to tetrafunctional acrylate or methacrylate selected from the group consisting of the acrylic and methacrylate acid esters of polyols.

4,133,732
COMBINATION ELECTRODE SYSTEM

Jan Boeke, P.O. Box 2327, Chapel Hill, N.C. 27514

Filed Jun. 10, 1976, Ser. No. 694,655
Int. Cl.[2] G01N 27/36
U.S. Cl. 204—195 G 12 Claims

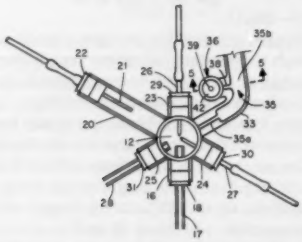


1. A device for sensing ions in liquids comprising a sealed receptacle having an outer wall, an outer shell disposed partially about the receptacle and distanced therefrom to provide a space therebetween, part of the outer wall being outside of the space, a reference solution disposed in the space, an ion-permeable seal on the space for retaining the reference solution while permitting it to be disposed in ion-permeable contact with a liquid to be tested, a pair of openings in the wall of the receptacle, one of the openings being connected to the space and the other of the openings being disposed in the part of the wall outside of the space for contact with the liquid, a pair of solid state ion-sensitive electrodes being mounted in the openings whereby one of the solid state ion-sensitive electrodes is in ionic contact with the reference solution within the space and the other is adapted for ionic contact with the test liquid, an impedance transforming integrated circuit member having a high input impedance and a low output impedance disposed within the receptacle, and the member being connected between the solid state ion-sensitive electrodes whereby the ions in the liquid to be tested are measured by comparison of the signals derived from the solid state ion-sensitive electrodes and the exposure of high impedance components to leakage is minimized.

4,133,733
ELECTROLYTIC TITRATION APPARATUS

Robert T. Moore, Palo Alto, Calif., assignor to Envirotech Corporation, Menlo Park, Calif.

Filed Jun. 17, 1977, Ser. No. 807,479
Int. Cl.[2] G01N 27/44
U.S. Cl. 204—195 T 19 Claims



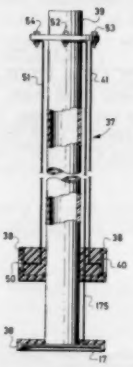
1. An electrolytic cell for use in an electrolyte titration apparatus comprising:

a. a vessel having a bottom and a sidewall defining a chamber for containing liquid electrolyte;
b. means for introducing a carrier fluid containing a constituent to be titrated into contained electrolyte in said chamber;
c. first and second generating electrodes mounted in electrolytic communication with the contained electrolyte in said chamber to generate titrant, said second generating electrode being mounted through said sidewall directly in said chamber to extend horizontally in the contained electrolyte;
d. a sensor electrode mounted in said chamber to extend into the contained electrolyte;
e. a reference electrode mounted in electrolytic communication with the contained electrolyte in said chamber; and
f. means for introducing gas into said chamber for mixing, between horizontal stratas, the contained electrolyte therein without baffles.

4,133,734
PORTABLE SENSOR FOR MEASURING THE CORROSION ENDANGERING AND ELECTROCHEMICAL PROTECTION OF A METAL STRUCTURE BURIED IN AN ELECTROLYTE IN A CURRENT FIELD

Josef Polák; Lubomír Boubela, and Josef Mrazek, all of Prague, Czechoslovakia, assignors to Chemoprojekt, projektova, Prague, Czechoslovakia

Filed Jun. 29, 1977, Ser. No. 811,248
Claims priority, application Czechoslovakia, Jan. 7, 1976, 4354-76
Int. Cl.[2] G01N 27/46
U.S. Cl. 204—195 C 3 Claims



1. A portable sensor for measuring the corrosion endangering and electrochemical protection of a metal structure buried in an electrolyte in a current field, said sensor comprising:

an elongated cylindrical carrier comprising a dielectric material with the longer dimension of said carrier having two opposing ends, said longer dimension of said carrier being at least double the shorter dimension thereof;

a first auxiliary metal electrode mounted on one end of the carrier, insulated on the side adjacent the carrier, said electrode having an axis parallel to the longitudinal axis of the carrier and a measuring area S on the bare metallic surface of said electrode;

second and third auxiliary metal electrodes mounted on the periphery of the carrier, each of said second and third electrodes being insulated on one side adjacent the carrier, said second and third electrodes being disposed opposite each other on the carrier with the axes thereof at right angles tp the longitudinal axis of said carrier, one of said second and third electrodes having a measuring area on the bare metallic surface thereof in the range of 0.1 that of

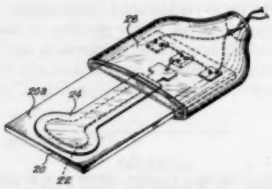
S to 0.01 that of S, the measuring area on the bare metallic surface of the other of said two electrodes being in the range of 0.01 that of S to 0.0001 that of S.

4,133,735

ION-SENSITIVE ELECTRODE AND PROCESSES FOR MAKING THE SAME

Martin A. Afromowitz, and Sinclair S. Yee, both of Seattle, Wash., assignors to The Board of Regents of the University of Washington, Seattle, Wash.

Filed Sep. 27, 1977, Ser. No. 837,279
Int. Cl.[2] G01N *27/30, 27/36;* B05D *1/18;* C23B *15/00*
U.S. Cl. 204—195 G 96 Claims



1. An improved ion-sensitive electrode comprising:

(a) a substrate formed into a wafer having a substantially planar wafer surface;

(b) a conductor bonded to said wafer, said conductor having first and second regions, with at least said first region being formed as a conducting layer on said substantially planar wafer surface;

(c) an ion-sensitive membrane bonded to said wafer and to at least a portion of said conductor, said membrane including a continuous membrane layer covering said first region of said conductor and portions of said substantially planar wafer surface contiguous to said first region of said conductor;

(d) output means connected to said second region of said conductor for interconnecting said electrode with a utilization device; and

(e) fluid-tight sealing means bonded to said wafer, to said conductor, and to said output means, said fluid-tight sealing means covering at least said second region of said conductor and portions of said wafer and said output means adjacent said second region of said conductor.

35. A process for fabricating an ion-sensitive electrode, said process comprising the steps of:

(a) fabricating a wafer from a substrate material, said wafer having a substantially planar wafer surface;

(b) forming a continuous conducting layer having a desired configuration on said substantially planar wafer surface;

(c) forming a continuous ion-sensitive membrane layer on a first region of said continuous conducting layer and portions of said substantially planar wafer surface contiguous to said first region of said continuous conducting layer;

(d) connecting at least one lead to a second region of said continuous conducting layer; and

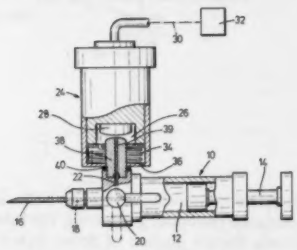
(e) forming a fluid-tight seal over at least said second region of said continuous conducting layer, portions of said substantially planar wafer surface contiguous to said second region, and a portion of said lead adjacent said second region.

4,133,736

APPARATUS FOR DETERMINING AN OXYGEN CONTENT

Masaru Nakagawa, Tama; Yasuaki Saito, Gamagori, and Hideaki Okada, Habikino, all of Japan, assignors to Iijima Products M.F.G. Co., Ltd. and Okada Shigyo Co., Ltd., both of, Japan

Filed Nov. 22, 1977, Ser. No. 853,909
Int. Cl.[2] G01N *1/24, 27/30, 27/46*
U.S. Cl. 204—195 P 6 Claims



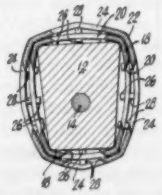
1. An apparatus for determining the oxygen content in a sealed container, being an integral unit comprising a sampling tube having a sampling zone provided with pumping means, a single multipositionable change-over valve for communicating the sampling zone selectively with either an inlet or an outlet path, an oxygen measuring device containing an electrode for oxygen determination air-tightly but removably connected to said sampling tube, one end of said outlet path being opened against the electrode, said inlet path having a sucking needle located at its sample receiving end.

4,133,737

SHIELDED ANODES

John O. Trimble, Malverne, Pa., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jun. 27, 1977, Ser. No. 810,299
Int. Cl.[2] C23F *13/00*
U.S. Cl. 204—197 12 Claims



1. A shielded anode for controlling corrosion when immersed, comprising:

a main anode body and sheathing substantially surrounding said body, said sheathing comprising an inner shield and an outer shield fixed relative to each other, a plurality of spacer members extending between said inner and outer shields and between said inner shield and said body for maintaining said shields and said body in spaced relation respectively,

said inner shield including a first plurality of openings and said outer shield including a second plurality of openings, said first and second plurality of openings being fixedly arranged relative to each other respectively for preventing direct impact with said body.

4,133,738
ELECTRODE WITH A GRADED ELECTRICAL RESISTANCE SUBSTRATE

Fritz G. Will, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

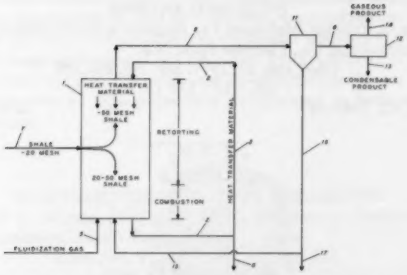
Filed Jul. 18, 1977, Ser. No. 816,480
Int. Cl.[2] C25B 11/12; C25C 1/16
U.S. Cl. 204—294 2 Claims

1. An electrode comprising a current collector, a graded electrical resistance conducting substrate, the substrate having a low resistance thicker portion of dense carbon foam and a high resistance thinner portion of less dense carbon foam, and the substrate having a surface of the low resistance portion in electrical contact with the current collector.

4,133,739
RETORTING PROCESS

David S. Mitchell, and David R. Sageman, both of San Rafael, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 727,558, Sep. 28, 1976, abandoned, and a continuation-in-part of Ser. No. 670,925, Mar. 26, 1976, abandoned, and Ser. No. 802,999, Jun. 3, 1977. This application Jun. 30, 1977, Ser. No. 811,496
Int. Cl.[2] C10G 1/02
U.S. Cl. 208—8 13 Claims



1. A continuous process for retorting hydrocarbon-containing solids in a vertically elongated retorting zone, said retorting zone including means for substantially impeding vertical back mixing of vertically moving solids substantially throughout said retorting zone, which comprises;

(a) introducing particulate solid heat-transfer material at an elevated temperature into an upper portion of said retorting zone;

(b) maintaining an upward flow of a fluidization gas through said retorting zone at a rate sufficient to maintain said heat-transfer material in a fluidized state;

(c) introducing into an intermediate level of said retorting zone a first portion of hydrocarbon-containing solids which is entrained by said fluidization gas and flows upwardly through said retorting zone whereby said first portion of said solids is heated to an elevated retorting temperature by contact with said heat-transfer material and said fluidization gas thereby forming a first portion of retorted solids and a first portion of vaporized hydrocarbons;

(d) introducing into an intermediate level of said retorting zone a second portion of hydrocarbon-containing solids which is fluidized by said fluidization gas and which flows downwardly through said retorting zone, whereby said second portion of said solids is heated to an elevated retorting temperature by contact with said heat-transfer material and said fluidization gas thereby forming a second portion of retorted solids and a second portion of vaporized hydrocarbons;

(e) reacting said second portion of said retorted solids in a lower level of said retorting zone with an oxygen-containing gas thereby forming combusted solids and a noncombustion-supporting fluidization gas, whereby said downflowing heat-transfer material is heated to an elevated temperature;

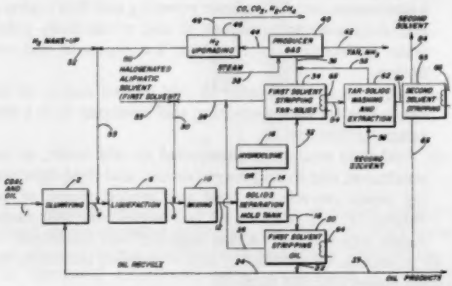
(f) maintaining a substantially net downward flow of said heat-transfer material and said second portion of said hydrocarbon-containing solids through said retorting zone by withdrawing from a bottom portion of said retorting zone a first effluent stream comprising said heat-transfer material and said combusted solids, said effluent stream being withdrawn at an elevated temperature;

(g) withdrawing from an upper portion of said retorting zone a second effluent stream comprising said fluidization gas containing said first and second portions of said vaporized hydrocarbons and said first portion of said retorted solids.

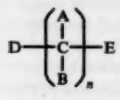
4,133,740
PROCESS FOR INCREASING THE FUEL YIELD OF COAL LIQUEFACTION PRODUCTS BY EXTRACTION OF ASPHALTENES, RESINS AND AROMATIC COMPOUNDS FROM SAID COAL LIQUEFACTION PRODUCTS

John A. Paraskos, Pittsburgh, Pa., and Edward W. Smith, Houston, Tex., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Oct. 21, 1977, Ser. No. 844,456
Int. Cl.[2] C10G 1/04
U.S. Cl. 208—8 14 Claims



1. A process for increasing the yield of a liquid synthetic fuel in a coal liquefication process which comprises forming a mixture by blending a coal slurry liquefaction product with a halogenated aliphatic solvent of the formula:



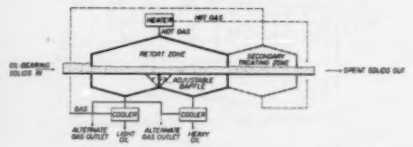
wherein n is an integer of from about 1 to about 20; and wherein A, B, D and E are either alike or different, members selected from the group consisting of hydrogen, chlorine,

bromine or fluorine and mixtures thereof, with the provision that at least one of said A, B, D or E is chlorine, bromine or fluorine; allowing the mixture to separate into an upper phase containing tar and a lower phase containing said solvent and the remainder of said coal liquefaction product; separating said phases from each other and treating said tar phase with a second solvent selected from the group consisting of benzene, n-hexane, cyclohexane or toluene and mixtures thereof, to recover asphaltenes, resins and/or aromatics in said tar phase.

4,133,741
METHOD FOR RECOVERY OF HYDROCARBON FRACTIONS FROM HYDROCARBON-BEARING MATERIALS

Bernard E. Welchman, Houston, Tex., and John H. Knight, Aurora, Colo., assignors to The Superior Oil Company, Houston, Tex.

Filed Nov. 5, 1974, Ser. No. 520,981
Int. Cl.² C10B *53/06*
U.S. Cl. 208—11 R **1 Claim**



1. A method for recovering a plurality of gas and liquid phase hydrocarbon fractions from oil shale in a continuous traveling grate retort, comprising the steps of:

forming a gas permeable bed of crushed oil shale particles on a traveling grate;

moving the oil shale bed along a horizontal path through a retort zone;

passing a flow of hot neutral or reducing gas downwardly through the bed in the retort zone to heat the oil shale particles to a temperature of from about 800° F. to about 1100° F. for a time effective to strip increasingly heavier hydrocarbons from the particles as the particles are moved through the retort zone;

collecting the gas and liquid hydrocarbons below the bed in the retort zone in a plurality of collection means disposed along the path of the bed and having adjustable baffles; and

adjusting the collection means baffles to collect a desired plurality of gas and liquid phase hydrocarbon fractions from the oil shale.

4,133,742
SEPARATION OF HYDROCARBONS FROM OIL SHALES AND TAR SANDS

William H. Hill, 38 Suzanne Ave., St. Paul, Minn. 55110

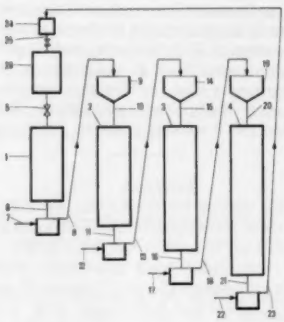
Filed Jul. 29, 1977, Ser. No. 820,223
Int. Cl.² B03B *9/02*
U.S. Cl. 208—11 R **3 Claims**

1. A process of separating hydrocarbons from oil shales or tar sands, which process comprises grinding oil shale or tar sand in water and reducing the shale or sand to a fine particle size, adding pulverized coal to the mixture of shale or sand and water and agitating to form an amalgam which contains the hydrocarbons of the oil shale or tar sand and the coal, separating the amalgam from the resulting mixture, and further separating the water and mineral matter for reuse of the water in the process.

4,133,743
MOVING BED CATALYTIC PROCESS FOR HYDROCARBON CONVERSION

Roger Boret, Le Pecq; Charles Bronner, Chatou; Roland Huin, Montesson-la-Borde, and André Vidal, Le Vesinet, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Continuation of Ser. No. 589,987, Jun. 24, 1975, abandoned, and Ser. No. 305,797, Nov. 13, 1972, abandoned. This application Nov. 15, 1976, Ser. No. 741,744
Claims priority, application France, Nov. 16, 1971, 71.41069; May 7, 1972, 72.04055; Mar. 13, 1972, 72.08731
Int. Cl.² C10G *13/16, 35/12*
U.S. Cl. 208—64 **15 Claims**



1. A process for the continuous conversion of hydrocarbons, in the presence of a granular catalyst containing a carrier and at least one metal selected from the group consisting of metals from groups VI a, VII a and VIII of the periodic classification of the elements, comprising circulating a charge formed of hydrogen and hydrocarbons through a reaction space comprising at least two elementary catalytic zones, connected in series, substantially vertical and placed side by side, each of them being of the moving bed type, the charge circulating successively through each zone and the catalyst also passing successively through each zone and moving continuously downwardly therethrough, continuously withdrawing the catalyst from the bottom of the last catalytic zone, passing resultant withdrawn catalyst to an accumulator, and from the accumulator sending the catalyst to a fixed bed regeneration zone, isolating the fixed bed regeneration zone from the process during regeneration, the catalyst in the regeneration zone where, forming a fixed bed, it is successively subjected in the form of said fixed bed (a) to a combustion by means of a gas containing molecular oxygen whose oxygen content by volume is from 0.01 to 1%, (b) to an oxychlorination by means of a gas containing molecular oxygen whose oxygen content by volume is from 1 to 3% and simultaneously by means of at least oe alkyl halide, and (c) to a final oxidation treatment by means of an oxygen-containing gas whose oxygen content by volume is from 3 to 20%, passing resultant regenerated catalyst to a reducing zone and from which the reduced catalyst is progressively reintroduced into the upper part of the first catalytic zone of the reaction space so as to maintain a substantially constant high level of activity in each point of the catalytic zones.

4,133,744
HYDROCARBON HYDROFINING UTILIZING A CATALYST CONTAINING A SYNTHETIC AMORPHOUS SILICA

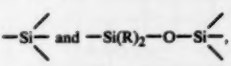
Thomas O. Mitchell, Trenton, and Darrell D. Whitehurst, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 738,790, Nov. 4, 1976, abandoned, which is a continuation-in-part of Ser. No. 638,405, Dec. 8, 1975, Pat. No. 4,003,825, which is a division of Ser. No. 450,967, Mar. 14, 1974, Pat. No. 3,983,055. This application Apr. 14, 1978, Ser. No. 896,419

Int. Cl.[2] C10G *23/04*

U.S. Cl. 208—213 **21 Claims**

1. A hydrofining process wherein a hydrocarbon feedstock is subjected to hydrofining conditions including a temperature of from about 300° C to about 550° C, a pressure of from about 10 atmosphere to about 200 atmospheres, a liquid hourly space velocity of from about 0.1 hr^{-1} to about 30 hr^{-1} and a hydrogen/ feedstock mole ratio of from about 1 to about 50 in the presence of a catalytic amount of a synthetic amorphous solid prepared by the steps of (1) hydrolyzing and (2) polymerizing at a temperature up to 200° C in the presence of water an admixture comprising a silane having the formula $R(Si)X_3$, wherein R is a nonhydrolyzable organic group, X is a hydrolyzable group and (Si) is selected from the group consisting of



and a second compound, R'_nMY_m, wherein R'is selected from the group consisting of the same groups as R, Y is selected from the group consisting of the same groups as X and oxygen, M is at least one member selected from the group consisting of the elements of Group III A Group VI B and Group VIII of the Periodic Table, m is any number greater than 0 and up to 8 and n is from 0 to any number less than 8, and (3) calcining the polymerized product.

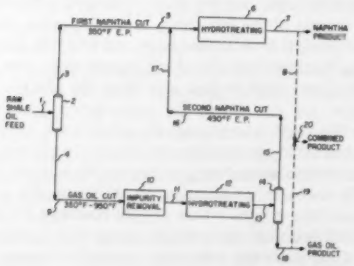
4,133,745
PROCESSING SHALE OIL CUTS BY HYDROTREATING AND REMOVAL OF ARSENIC AND/OR SELENIUM

Donald K. Wunderlich, Richardson, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 825,792, Aug. 18, 1977, abandoned. This application Jun. 5, 1978, Ser. No. 912,817

Int. Cl.[2] C10G *23/02*

U.S. Cl. 208—254 H **4 Claims**



1. A method for processing shale oil which contains nitrogen and at least one impurity selected from the group of arsenic and selenium comprising fractionating the shale oil feed to separate a first naphtha cut which essentially boils at or below 350° F. and a gas oil cut which essentially boils above 350° F., hydrotreating said first naphtha cut to remove nitrogen and to hydrogenate unsaturates therein, removing a substantial amount of said impurity from said gas oil cut, hydrotreating said gas oil cut after said impurity removal to remove nitrogen from said gas oil cut, fractionating said hydrotreated gas oil cut to separate a second naphtha cut which essentially boils above 380° F. and at or below 450° F. and has a high nitrogen content, and hydrotreating said second naphtha cut with said first naphtha cut to reduce said nitrogen content.

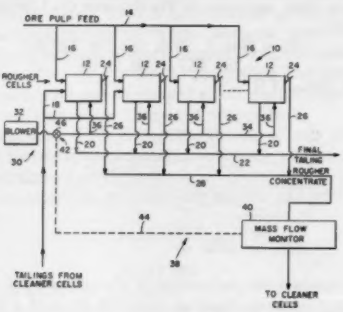
4,133,746
SYSTEM AND METHOD OF CONTROLLING FROTH FLOTATION

Gaylord W. Dopson, Oracle, Ariz., assignor to Magma Copper Company, New York, N.Y.

Filed Nov. 23, 1976, Ser. No. 744,306

Int. Cl.[2] B03B *13/00*; B03D *1/02*

U.S. Cl. 209—1 **4 Claims**



1. The method of maintaining substantially steady state conditions in a froth flotation operation, wherein an aqueous pulp of finely ground ore flows continuously into a flotation cell and is continuously aerated by admission of air, and an aqueous pulp of flotation concentrates substantially continuously overflows from said cell, which comprises continuously monitoring the mass flow of flotation concentrates from the cell and varying the rate of admission of aeration air into the pulp in the cell inversely with respect to variations in said mass flow.

4,133,747
METHOD FOR PROCESSING RAW COAL

Jan Visman, Edmonton, Canada, assignor to Canadian Patents & Development Limited, Ontario, Canada

Continuation of Ser. No. 732,493, Oct. 14, 1976, abandoned, which is a continuation-in-part of Ser. No. 633,983, Nov. 20, 1975, abandoned, which is a continuation-in-part of Ser. No. 550,553, Feb. 18, 1975, abandoned. This application Feb. 2, 1978, Ser. No. 874,499

Int. Cl.[2] B03B *9/00*

U.S. Cl. 209—10 **10 Claims**

1. A method for the beneficiation of crushed raw coal with the concomitant elimination of solids-containing liquid waste streams which comprises:

(a) slurrying the crushed raw coal in water and subjecting the slurried coal to a first gravimetric separation whereby a light fraction comprising clean coal and a heavy coal and waste containing fraction are produced;

(b) subjecting said light fraction to a first granulometric separation to produce a fine coal-containing fraction and a coarse, clean, coal product fraction;

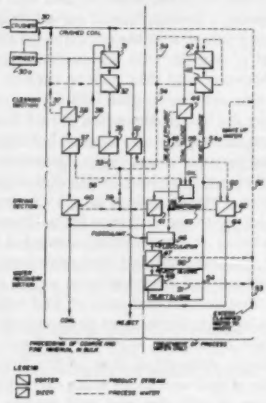
(c) subjecting said heavy coal and waste fraction to a second gravimetric separation to produce a middlings fraction and a heavy waste solids containing fraction;

(d) dewatering both said middlings fraction and said heavy

waste solids containing fraction, recycling said middlings fraction to the first gravimetric separation and passing said dewatered heavy solids fraction from the process as reject waste;

(e) subjecting the liquid stream obtained by dewatering said middlings fraction to a third gravimetric separation to produce a light fraction containing finely divided coal and a heavy fraction containing waste solids;

(f) subjecting said light fraction containing finely divided coal to a second granulometric separation to produce a coal sludge fraction and a reject effluent fraction containing finely divided waste material;



(g) agglomerating said coal sludge fraction and dewatering it to produce a clean fine coal product fraction, and a waste-containing effluent fraction;

(h) recycling said waste-containing effluent fraction to said third gravimetric separation;

(i) flocculating the solids in said reject effluent fraction and separating the flocculated solids to produce a reject cake and a clarified water stream, and

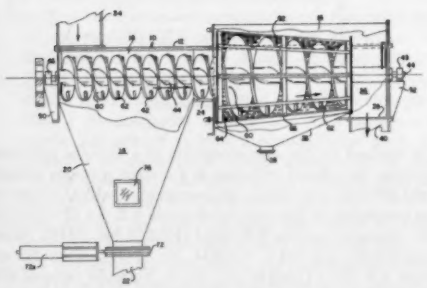
(j) recycling said clarified water stream to the coal slurry feed to said first gravimetric separation.

4,133,748

MATERIAL SEPARATOR

Harry E. Schaffer, Jr., Lewisburg, and C. Donald Fisher, Muncy, both of Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Aug. 9, 1977, Ser. No. 823,092
Int. Cl.² B03B *7/00*
U.S. Cl. 209—17 **5 Claims**



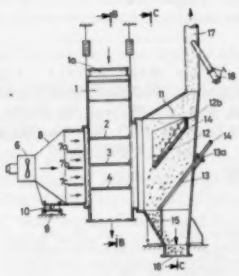
1. An improved separator of the type comprising a housing, said housing defining a settling chamber, a communicating drain chamber and a discharge chamber, said settling chamber extending downwardly from an upper region to a lower region, a material inlet port in said housing for introducing material to be separated into the upper region of said settling chamber, a rotatably disposed conveyor screw extending substantially horizontally through said settling chamber and said drain chamber and adapted to agitate and convey material from the material inlet port through the upper region of said settling chamber and through said drain chamber to said discharge chamber adjacent said drain chamber, means for rotating said conveyor screw at a predetermined rate, means in said settling chamber for introducing a liquid into the lower region of said settling chamber, means for periodically discharging settled materials from the lower region of said settling chamber, a screen disposed in said drain chamber to separate the material and liquid advanced from the upper region of said settling chamber by said screw conveyor, a drain port in said drain chamber beneath said screen for discharge from said housing of liquid passing through said screen, and a discharge port in said discharge chamber for discharging material from the housing wherein the improvement comprises using a screw conveyor that increases in flight diameter at the point where said screw conveyor enters said drain chamber and where said flight diameter decreases as said screw conveyor extends across said drain chamber and using a tapered cylindrical shaped screen that is mounted on said screw conveyor to rotate with said screw conveyor.

4,133,749

PROCESS OF SEPARATING SOLID GRANULAR METALLURGICAL PRODUCTS AND THEIR PRECURSORS AND APPARATUS

Horst Jelinek, Offenbach; Gerd Elsenheimer, Frankfurt am Main, and Bernhard Klersy, Ludwigshafen, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 28, 1977, Ser. No. 773,110
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1976, 2611401
Int. Cl.² B07B *4/08, 1/00*
U.S. Cl. 209—24 **14 Claims**



1. In a process of separating solid granular metallurgical products and their precursors by providing a plurality of linearly vibrating inclined screens spatially arranged one over the other, in a housing, each screen having an inclination greater than that of the screen above and wherein the width of the mesh openings in each screen is less than that of the screen above and the width of the mesh openings of each screen is 1.5 to 15 times larger than the desired parting size, and feeding the solids to be separated onto the uppermost screen at the upper end of said housing, the coarser solids being deflected in the direction of inclination of said uppermost screen, the finer solids initially falling through freely and onto lower screens having smaller mesh openings being deflected also in the direction of inclination of said lower screens, the coarsest solids fraction being withdrawn as overflow from said uppermost screen, finer solids fractions being withdrawn as overflow from following screens, and solids which have passed through

all screens being withdrawn as a finest fraction, the improvement which comprises flowing a gaseous fluid through at least part of the working space required for screening in a direction approximately transverse to the direction in which said solids pass through said screens at a rate and in an amount to effect entrainment of those solids having a lower specific gravity between successive adjacent screens by said gaseous fluid flowing through said working space and to effect the resulting gaseous fluid laden with said solids of lower specific gravity to flow into a separating chamber, and separating at least the coarser of said solids of lower specific gravity from the flowing gaseous fluid in said separating chamber, wherein said separating step includes providing a separating plate in the separating chamber which is rearwardly and upwardly inclined and has a forward edge extendible generally parallel to the level of each of said screens, separating said coarser solids on said plate by sliding same down on said plate and withdrawing same through a discharge opening from the lower portions of said separating chamber, and withdrawing said gaseous fluid and the finer solids entrained thereby upwardly behind said plate through the upper portions of said separating chamber.

4,133,750

PHOSPHATE FLOTATION PROCESS

George T. Burress, Bridgewater, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 627,450, Oct. 30, 1975, abandoned. This application Dec. 6, 1976, Ser. No. 748,089

Int. Cl.² B03C *1/02*

U.S. Cl. 209—166 **5 Claims**

1. An improved process for the beneficiation of phosphate ores in which there are at least a fatty acid flotation and an amine flotation, the improvement whereby the amount of reagent in the fatty acid flotation step is significantly reduced while recovering substantially the same quantity of bone phosphate of lime, said improvement being achieved by adding to the ore prior to said fatty acid flotation step from about 0.3 to about 0.7 pound per ton of ore of a fatty acid and from about 0.9 to about 2.1 pounds per ton of ore of a petroleum fraction and a combination comprising from about 0.005 to about 0.08 pound per ton of ore of a sulfonated aromatic hydrocarbon having a molecular weight of from about 350 to about 500 and from about 0.03 to about 0.10 pound per ton of ore of kerosene.

4,133,751

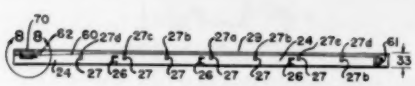
WIRE SCREEN WITH TENSIONING ASSEMBLY

Joseph E. Stengel, R.R. #2, Walnut, Ill. 61376

Filed Mar. 30, 1977, Ser. No. 782,921

Int. Cl.² B07B *1/49*

U.S. Cl. 209—404 **13 Claims**



1. A screen deck for use in a vibrating bed apparatus for grading various size materials, comprising:

a pair of spaced side rails;

a plurality of cross members mounted between said side rails, said cross members being attached to said rails at predetermined distances from one another, said cross members and said rails together defining a frame structure having a first end, a second end, a length dimension and a width dimension;

a tensioning assembly mounted along the first end of said frame structure, said tensioning assembly including first and second walls spaced from one another, said first wall having a first plurality of openings in it, said second wall having a corresponding second plurality of openings in it, individual ones of said first and second opening pluralities being aligned to define a passage through said first and second walls, said second wall further having a third plurality of openings in it, and a plurality of bolts, individual ones of said bolts being mounted in the passage defined by said first and said second opening pluralities, each of said bolts having a first end extending outwardly of said first wall and a second end having a predetermined shape arranged so that movement of the first end of said first bolt in a direction away from said first wall draws the second end of said bolt toward and into individual ones of said third plurality of openings in said second wall;

an anchor end support means mounted along the second end of said frame; and

a plurality of ribs mounted between said side rails, each of said ribs having a predetermined curvature imparted to it along its longitudinal axis, the curvature of said ribs delimiting a first crown for said screen deck, said ribs being mounted between said side rails at various heights with respect to one another to give said screen deck a second crown along the length dimension of said frame structure, said ribs and said anchor end support having a plurality of notches and grooves respectively, formed in them, and a plurality of closed wire loops, said wire loops being constructed from a predetermined length of wire, the ends of which are joined to each other to form a loop, each of said wire loops being arranged into an elongated shape having a first end and a second end, said wire loop delimiting a first wire strand and a second wire strand extending between the first and second ends of said wire loops, said wire loops being positioned so as to extend between the bolts of said tensioning assembly and said anchor end support means, respective ones of the first and second wire strands of said wire loops being carried in the notches and grooves of said ribs and said anchor end support means.

4,133,752

METHOD FOR DECOMPOSITION OF PHTHALIC ACID ESTERS BY USE OF MICROORGANISMS

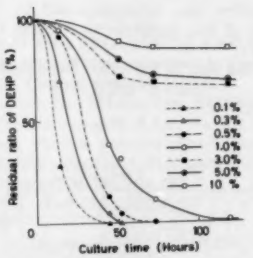
Ryuichiro Kurane; Tomoo Suzuki, and Yoshimasa Takahara, all of Chiba, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Mar. 31, 1977, Ser. No. 783,283

Claims priority, application Japan, Jun. 2, 1976, 51-64985

Int. Cl.² C02C *1/06*; C12B *1/00*

U.S. Cl. 210—12 **15 Claims**



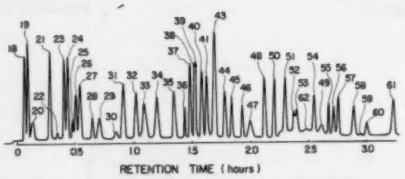
1. A method for the decomposition of a phthalic acid ester comprising the step of culturing in a culture medium containing said phthalic acid ester a microorganism selected from the group consisting of *Nocardia erythropolis* KR-S-1 (FERM No. 3530), *Nocardia restricta* KR-242-1 (FERM No. 3919), *Nocardia blackwellii* KR-254-1 (FERM No. 3921), *Nocardia erythropolis* KR-256-2 (FERM No. 3923), *Nocardia restricta* KR-260-2 (FERM No. 3924), *Nocardia erythropolis* KR-23-1 (FERM No. 3913), *Nocardia erythropolis* KR-23-3 (FERM No. 3914), *Nocardia minima* KR-48-1 (FERM No. 3915), *Nocardia calcarea* KR-62-1 (FERM No. 3916), and *Nocardia erythropolis* KR-71-1 (FERM No. 3918).

4,133,753

METHOD OF ION EXCHANGE CHROMATOGRAPHY

Seiji Takeuchi, Hitachiohta, and Kazunori Fujita, Naka, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 26, 1977, Ser. No. 845,721
Claims priority, application Japan, Nov. 10, 1976, 51/135637
Int. Cl.[2] B01D *15/08*
U.S. Cl. 260—112.5 R 12 Claims



3. A method for the chromatographic separation of organism liquid including amino acids by means of introducing successively to a column of an ion exchange resin a plurality of sorts of elutes, said elutes containing alkali metal ions, during the separation of components of the organism liquid, which method comprises the steps of:

(1) introducing to the column a first elute having a predetermined pH and a predetermined alkali metal ion concentration,

(2) introducing to the column a second elute, the pH of which is higher than that of the first elute, and the alkali metal ion concentration of which is higher than that of the first elute,

(3) introducing to the column a third elute, the pH of which is lower than that of the second elute, and the alkali metal ion concentration of which is higher than that of the second elute, and

(4) introducing to the column a fourth elute, the pH of which is higher than that of the second elute, and the alkali metal ion concentration of which is higher than that of the third elute.

4,133,754

WATER PURIFICATION DEVICE

Barbara H. Bory, Fort Lee, and Alan B. Kessler, Ramsey, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Continuation-in-part of Ser. No. 728,375, Sep. 30, 1976, Pat. No. 4,039,444. This application Jun. 13, 1977, Ser. No. 805,751
The portion of the term of this patent subsequent to Feb. 8, 1994, has been disclaimed.
Int. Cl.[2] B01D *15/00*
U.S. Cl. 210—36 19 Claims

1. A water purification device comprising:

(a) a closed container, wherein at least one functional surface of said container is a porous to water non-woven fabric wherein said fabric has a weight of about 150 to 650 grains/yd^2, a porosity of at about 100 cfm/ft^2 to about 800 cfm/ft^2, a dry machine direction grab tensile strength of at least 3 pounds/linear inch, a dry cross direction grab tensile strength of at least 2 pounds/linear inch, a wet machine direction grab tensile strength of at least 1 pound/linear inch, and a wet cross direction grab tensile strength of at least 0.75 pounds/linear inch;

(b) an amount, sufficient to treat said water of granular activated carbon contained in said container; and

(c) an ingredient that will inhibit the migration of fine particles of said carbon through said fabric when said device is immersed in water, wherein said ingredient is compatible to the particle size distribution of said carbon and is dispersed therein, in an amount sufficient to inhibit the migration of fine particles of said carbon through said porous fabric when said device is immersed in water and wherein said ingredient will not normally adversely affect the palatability of said water

wherein said ingredient is selected from the group consisting of:

(a) a pregelatinized, pH modified epichlorohydrin cross-linked tapioca starch having a gross swelling power of about 16 measured after thirty minutes, a pH of about 6, and a predominant mesh size of about 20 to 100 mesh,

(b) a pH modified, epichlorohydrin cross-linked corn starch having a gross swelling power of about 13 measured after forty-five minutes, a pH of about 6, and a predominant mesh size of about 12 to 100 mesh,

(c) a substantially pure aluminum lanolate soap in the form of free-flowing particles having a predominant mesh size of about 40 mesh, and

(d) combinations thereof.

4,133,755

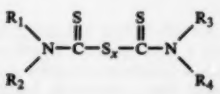
AGENT FOR REMOVING HEAVY METALS

Ryohkichi Tarao, Tokosuka; Kanji Kaku, Yokohama; Masaki Hayashi, Yokohama; Takao Nakamura, Yokohama; Shigeo Ohishi, Funabashi, and Hajime Yamano, Tokyo, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Jul. 25, 1977, Ser. No. 818,650
Claims priority, application Japan, Jul. 26, 1976, 51-88822; Jul. 29, 1976, 51-90465; Jun. 2, 1977, 52-65044
Int. Cl.[2] C02B *1/42;* B01J *31/02;* C09K *3/00*
U.S. Cl. 210—38 B 21 Claims

1. An agent for removing mercury from waste waters containing the same, which consists essentially of

(a) a compound which is characterized by the general formula:



wherein R_1, R_2, R_3, and R_4 are each either a hydrogen atom or an alkyl having 1 – 3 carbon atoms, and (R_1 and R_2) and (R_3 and R_4) can form a ring together with the terminal nitrogen atom, respectively, and x is an integer of 1 – 4,

(b) amorphous silica and

(c) active carbon powder,

the ratio by weight of said compound to said amorphous silica being in the range of 20:1 – 1:2, and

the ratio by weight of said compound to said active carbon powder being in the range of 10:1 – 1:10.

4,133,756

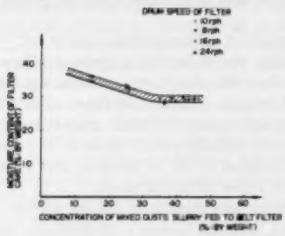
METHOD FOR DEHYDRATING A MIXED DUST SLURRY

Izumi Arai, Chigasaki; Yasuteru Yamada; Akio Mutsuta, both of Wakayama, and Kenji Kadota, Niihama, all of Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo and Sumitomo Metal Industries, Ltd., Osaka, both of, Japan

Continuation of Ser. No. 659,781, Feb. 20, 1976, abandoned. This application Sep. 2, 1977, Ser. No. 830,196
Int. Cl.[2] B01D *33/10*
U.S. Cl. 210—67 6 Claims

1. In a method for dehydrating a dust-containing slurry mixture of a blast furnace slurry and a converter slurry collected in iron and steel works to produce a filter cake and feeding the filter cake thus produced to a stage for recovering dust, the slurry mixture being fed to a rotary type belt filter for dehydration, the steps of maintaining the solid dust concentration of the mixture within a range of 35% to 45%, by weight,

before the mixture is fed to the filter such that the moisture content of the filter cake produced on the filter is kept substantially constant at about 30% by weight regardless of variations in the rotational speed of the filter.



4,133,757

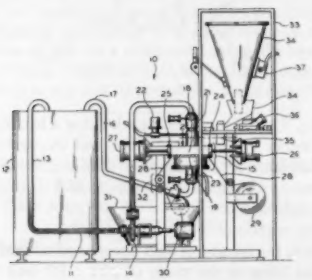
APPARATUS AND METHOD FOR CONTINUOUS PLATING BATH TREATMENT SYSTEM

John G. Koltse, 2939 N. Oakley, Chicago, Ill. 60648

Continuation-in-part of Ser. No. 705,796, Jul. 16, 1976, abandoned. This application Apr. 8, 1977, Ser. No. 785,832

Int. Cl.[2] B01D *29/02*

U.S. Cl. 210—75 **6 Claims**



1. In combination with automatic filtration apparatus of the type having a filter chamber through which continuous filter medium may be intermittently passed, and an entry door selectively openable and closeable to enable ingress of said filter medium to said filter chamber, wherein said filter medium may be advanced to said chamber to bring fresh segments of said filter medium into filtering position, while moving used segments of said filter medium out of filtering position, the improvement comprising:

means for positioning said fresh segments to receive at least one additional dry filter material;

means for delivering said additional dry filter material to said segments,

said delivery means initiating deposit of said dry filter material when said segments, are advanced toward said filter chamber, and interrupting deposit when a predeterminable amount of said dry filter material has been deposited; and

means to selectively regulate the amount of said dry filter material deposited on said segments.

4,133,758

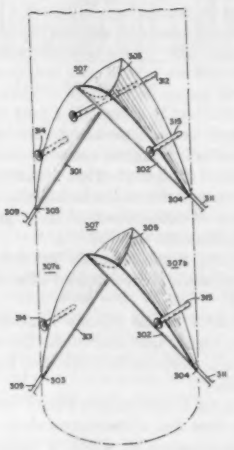
GRAVITY SETTLING

Hymen R. Davis, Glenridge; R. H. Long, Morristown, and A. A. Simone, Dover, all of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Continuation-in-part of Ser. No. 720,686, Sep. 7, 1976, abandoned. This application Sep. 22, 1977, Ser. No. 835,498

Int. Cl.[2] B01D *21/02*

U.S. Cl. 210—83 **7 Claims**



1. A process for separating solids from a liquid by gravity settling, comprising:

introducing a liquid containing dispersed solids into a gravity settler at multiple locations;

intercepting the settling paths of the solids below each of the feed locations by bringing the solids into contact with inclined intercepting surfaces which divide the gravity settler into separate separation zones to thereby coalesce the solids and increase the solids settling rate, said inclined, intersecting surfaces being at least two vertically spaced, inverted V-shaped plates, each formed of first and second downwardly inclined, upwardly curved, intersecting conical sections having their apices at the vessel wall and defining a substantially enclosed separation zone therebetween;

recovering a solids containing underflow from the separate separation zones; and

recovering an essentially solids free overflow from the separation zones.

4. A gravity settler for effecting solid-liquid separation, comprising:

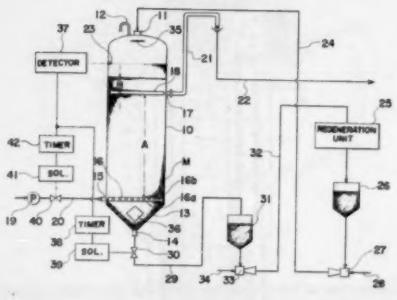
a vessel; at least two vertically spaced V-shaped plates, each formed of first and second downwardly inclined, upwardly curved, intersecting conical sections having their apices at the vessel wall and defining a substantially enclosed chamber therebetween;

inlet means for introducing a liquid-solid feed between the at least two vertically spaced plates; underflow outlet means for withdrawing solid containing underflow from the chamber at each of the apices of the conical sections; and overflow outlet means for withdrawing overflow from an upper portion of the chamber.

4,133,759
LIQUID PURIFICATION APPARATUS

Yorifumi Ikeda, Suita, and Kikuo Nishikawa, Neyagawa, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Aug. 31, 1976, Ser. No. 719,386
Claims priority, application Japan, Nov. 3, 1975, 50-131954; Apr. 8, 1976, 51-40622
Int. Cl.² B01D *15/06*
U.S. Cl. 210—104 **13 Claims**



2. A liquid purification apparatus for purifying a liquid, said apparatus comprising:

an adsorbent material supply means for continuously supplying an adsorbent material to purify said liquid;

a hollow column connected to said supply means and containing a mass of said adsorbent material therein, said column having an adsorbent material inlet and an adsorbent material outlet spaced from each other at the top and bottom, respectively, of said column, both said inlet and outlet being connected to said supply means, said inlet receiving said adsorbent material from said supply means and said outlet returning said material from said column to said supply means;

a liquid supply means for continuously supplying said liquid to be purified to said column;

a liquid rectifier means within said column at the lower portion thereof and connected to said liquid supply means for dispersing said liquid in a uniform upwardly directed flow within said column;

a liquid collector means within said column at a predetermined position above said rectifier means for removing the liquid flowing upward from said rectifier means through said material from said column;

said rectifier and collector means being completely emdedded within said mass of adsorbent material inside said column;

said mass of adsorbent material within said column forming a bed with a height less than the height of the inside of said column and said bed forming a settling layer above said liquid collector means and the uppermost surface of said bed, said settling layer preventing fluidization and expansion of said adsorbent material therebeneath, and said settling layer varying in depth during the continuous purification of said liquid in said column;

valve means positioned at the adsorbent material outlet from said column for regulating the flow of adsorbent material in said column outward through said outlet;

adjustment means in said liquid supply means for adjusting the rate of liquid supplied to said rectifier means during the period when said valve means is open and said adsorbent material is withdrawn from said column therethrough, said liquid supply rate being maintained at a level so as to prevent said fluid flowing upward through said bed from fluidizing said adsorbent material in said bed;

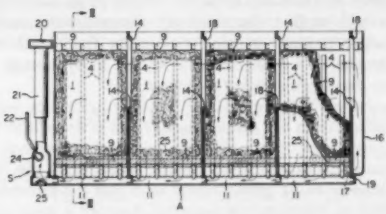
liquid level control means in said column for maintaining the uppermost level of said liquid being purified in said column above the uppermost surface of said adsorbent material; and

control means between the top of said column and said valve means for controlling the opening and closing of said valve means for predetermined periods of time in relation to the elevation of the uppermost level of adsorbent material continuously supplied to said column through said inlet, said predetermined period of time during which said valve means is opened corresponding to the time span between the time when the depth of said settling layer exceeds a predetermined maximum value and the time when said settling layer returns to its initial lowermost depth as a result of discharging said adsorbent material through said outlet.

4,133,760
KNOCKDOWN TYPE FILTERING DEVICE

Yonekichi Ogawa, 4-5-3 Nakameguro, Meguro-ku, Tokyo, Japan

Filed Jun. 29, 1977, Ser. No. 811,676
Claims priority, application Japan, Jul. 2, 1976, 51/88674
Int. Cl.² E04H *3/16*
U.S. Cl. 210—169 **7 Claims**



1. A knockdown filtering device for use in a water tank comprising a plurality of filtering units, a connecting pipe on which said filtering units are detachably supported in adjacent parallel relation, said connecting pipe having openings for receiving waste water in said tank, water inlet means coupled to said connecting pipe at one end thereof for introducing the waste water to said filtering units for flow therethrough in succession, a common drain passage communicating with said filtering units for receiving purified water therefrom, and air lift means coupled to said drain passage for circulation of the purified water back into the tank, each of said filtering units comprising a filtering chamber filled with filtering material and an outlet connecting said filtering chamber with said drain passage, said filtering chambers having openings for communication of one chamber with an adjacent chamber for flow of water from the inlet means through said chambers, each of said chambers being provided with a groove, said connecting pipe being detachably fitted in the grooves of adjacent chambers to extend therealong for assembly of the chambers on said pipe, said common drain passage being formed by individual drain passages provided in said chambers below said groove, which drain passages are assembled in communicating relation when the chambers are mounted on said connecting pipe in communicating relation with one another.

4,133,761
SUBMERGED SETTLER FOR SUSPENDED SOLIDS

Edward S. Posgate, 48 Roberts Crescent, Brampton, Ontario, Canada (L6W 1G8)

Continuation-in-part of Ser. No. 790,259, Apr. 25, 1977, abandoned. This application Jun. 28, 1977, Ser. No. 810,670
Int. Cl.² E02B *5/08*
U.S. Cl. 210—170 **26 Claims**

1. A submersible settling enclosure comprising:

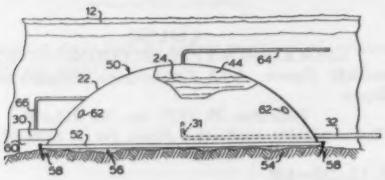
(a) an enclosure wall, in the form of a flexible membrane, defining a settling chamber;

(b) a large body of water having a bottom bed surface and an open top surface;

(c) means for retaining peripheral edge portions of said flexible enclosure wall membrane in a position sealed against the bed surface of said large body of water;

(d) buoyant floatation means located within said flexible enclosure wall membrane and operative for supporting a portion of said enclosure wall above said bed surface to maintain the settling chamber in an expanded configuration when submerged;

(e) input passage means opening directly through said flexible enclosure wall for placing the settling chamber in direct unrestricted fluid communication with the body of



water in which it is to be submerged so as to admit water to said settling chamber, and the enclosure having an output passage opening outwardly from said settling chamber at a point remote from said input passage means for discharging water therefrom, and

(f) suction conduit means connected to withdraw water by suction from the output passage and convey it to an onshore water treatment plant, the output passage being spaced from the input passage means and the settling chamber being proportioned such that the distance travelled by the water through the chamber is great as compared with the height of the wall membrane above said bed.

4,133,762

COIL TYPE FILTER

Marco P. Visceglia, 6118 Liebig Ave., Bronx, N.Y. 10471, and Robert Lorenzo, 12 Regina Ct., Bay Shore, Long Island, N.Y. 10466

Filed Dec. 12, 1975, Ser. No. 640,015
Int. Cl.² B01D *23/14, 35/18*
U.S. Cl. 210—186 **7 Claims**

1. A flow through coil type filter for fluids comprising:

a hollow coil having an inlet at one end, an outlet at the other end thereof and a predetermined number of turns therebetween to provide sufficient contact time and turbulence within the filter, to enhance the adsorption process in the coil as the fluid flows therethrough,

a pair of screens positioned within the coil and mounted completely across the inlet and the outlet of said coil respectively,

a predetermined quantity of activated carbon granules positioned within said coil and partially filling said coil, said activated carbon granules serving as the filtering element and, being capable of reactivation within the coil, and,

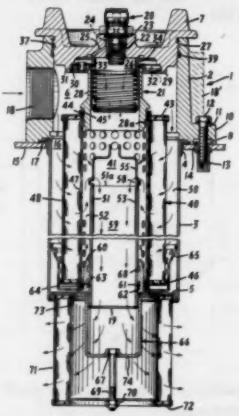
means for readily coupling said filter to a fluid flow system for filtering purposes.

4,133,763

FILTER ASSEMBLY WITH REPLACEABLE FILTER ELEMENT

Roydon B. Cooper, Locust Valley, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Filed Dec. 5, 1977, Ser. No. 856,959
Int. Cl.² B01D *27/04*
U.S. Cl. 210—232 **16 Claims**



1. A filter assembly having a filter chamber and a filter element therein that is replaceable without contamination of filtered fluid with unfiltered fluid in the filter chamber even though the filter chamber is not emptied of unfiltered fluid when a filter element is removed and installed, comprising, in combination, a filter housing; a filter chamber in the housing; an inlet for unfiltered fluid and an outlet for filtered fluid in the housing; a filter element removably disposed in the filter chamber across the line of fluid flow from the inlet to the outlet so that fluid flow from the inlet to the outlet normally proceeds through the filter; a weir spaced from and downstream of the filter element, compelling filtered fluid from the filter flowing towards the outlet to proceed upwardly through the space between the weir and the filter and then by overflow across the weir; and a weir follower operatively associated with the base of the filter element and movable along the weir in fluid-tight relation to the base and the weir, to carry filtered fluid in the space between the weir and the filter element on the downstream side of the filter element to the top of the weir while a used filter element is being removed, and to displace unfiltered fluid in the filter chamber from contact with the downstream side of a clean filter element while the clean filter element is being installed.

4,133,764

RETAINING DEVICE FOR APPARATUS HAVING SEMI-PERMEABLE MEMBRANES

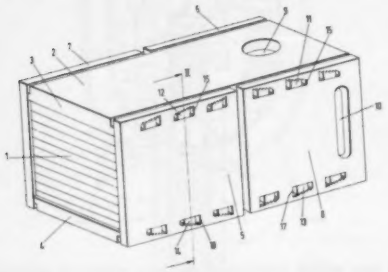
Robert Bardin, Vienne, and Hubert Leymarie, Villeurbanne, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Dec. 15, 1975, Ser. No. 640,928
Claims priority, application France, Dec. 18, 1974, 74 41791
Int. Cl.² B01D *31/00*
U.S. Cl. 210—236 **13 Claims**

1. In a retaining device for a fluid treatment apparatus having a stack of membranes and spacers, said device comprising two end plates which compress said stack between them, one end plate being a lower plate for supporting said stack, at least two side plates, connecting means on said lower plate and said side plates which connect the lower plate and said side plates, the other end plate being an upper plate adapted to be placed adjacent said stack, and cooperating locking means on said upper plate and said side plates which lock the upper plates to

said side plates, at least one of said means being capable of permitting movement of said side plates with respect to at least one end plate,

the improvement consisting in that said locking means comprises a plurality of spaced apart openings and a plurality of cooperating spaced apart projections insertable in the openings having abutting faces at least one of which is inclined at an acute angle to the plane of the upper plate, at least some of said side plates and upper and lower plates



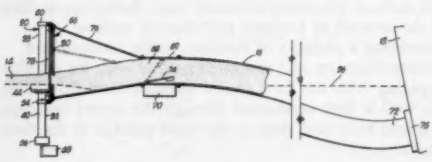
being relatively movable with respect to one another in a direction parallel to said upper and lower plates, until the point of contact between the abutting faces of the openings and the projections is such that said contact between the abutting faces maintains a compressive force between the various elements forming the stack at a predetermined value, and means on said at least one inclined face enabling maintenance of said compressive force between the various elements forming the stack.

4,133,765

DEVICE FOR RETRIEVING FLOATING POLLUTANTS ON SURFACE WATER

Vekoslav A. Stupica, 2911 N. 73rd Pl., Kansas City, Kans. 66109

Filed Sep. 21, 1977, Ser. No. 835,041
Int. Cl.[2] E02B *15/04*
U.S. Cl. 210—242 S **1 Claim**



1. Recovery apparatus for retrieving surface contaminants from a body of water, said apparatus including:

an elongate, horizontally extending series of buoyant normally upright laterally offset posts at the surface of said body of water,

each post being partially submerged in said body and having an upstanding end segment projecting above the water surface;

an elongate, substantially imperforate, flexible fence supported on said series of posts in a partially submerged disposition to present a horizontally extending contaminant barrier projecting upwardly from the surface of the water,

said barrier having a contaminant-engaging front side and an opposed back side;

at least one passage formed in said fence permitting contaminant flow through said barrier from said front side to said back side,

said passage being partially submerged in said body; a contaminant intake tube for receiving contaminants flowing through said passage,

said intake tube having a mouth offset from said passage in proximal relation thereto, and an opposed outlet remote from said mouth;

flexible conduit means intercoupling said passage and said mouth for establishing flow communication therebetween while permitting vertical movement of the mouth relative to the passage;

a floatation device for said mouth buoyantly supporting the latter on the surface of said body of water, said device comprising an inflatable bladder for permitting selective adjustment of the buoyant force on said mouth;

unidirectional gate means in said mouth for permitting only one-way flow of contaminants therethrough in a direction away from said passage; and

a reservoir for storing contaminants conveyed through said tube, said reservoir having an inlet coupled with said outlet at an elevation below said mouth whereby contaminants moving through said passage are conveyed to the reservoir by gravity flow,

and a skimmer pivotally mounted on said intake tube at said mouth for up and down swinging movement within said conduit, said skimmer being provided with a float for shifting in response to up and down movement of the surface of said body of water,

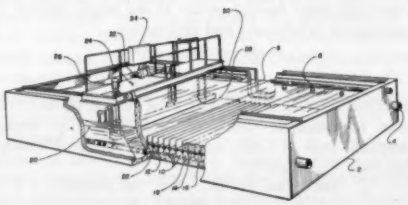
said skimmer including a generally horizontally disposed plate having a plurality of spaced, parallel ribs and rows of apertures intermediate said ribs, whereby to effect separation of oil and water during the recovery process.

4,133,766

FILTER MEDIA SUPPORT AND CONTAINMENT SYSTEM

Richard A. Adie, Sykesville, Md., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Mar. 11, 1977, Ser. No. 776,722
Int. Cl.[2] B01D *29/08, 29/38*
U.S. Cl. 210—275 **19 Claims**



1. An improved granular media filter of the type including a filter tank, means for dividing the tank into a plurality of cells, means within each cell for holding horizontal porous support plates, a bed of filter media on the porous support plates, influent means for delivering fluid to be treated to the top of the filter bed, filtrate receiving means in each cell below the support plates for receiving the treated fluid, an effluent channel for removing the treated liquid from the filter, port means for delivering the treated liquid from each filtrate receiving means to the common effluent channel and backwashing means that cooperate with the port means to force a backwashing liquid back through the port means and filtrate receiving means and up through the filter bed for removing contaminants therein and thereon wherein the improvement comprises a prefabricated lightweight plastic cell system that divides the filter into the plurality of cells, provides the horizontal support means for the porous plates, provides the filtrate receiving means and provides the port means, the plastic cell system comprising:

a. a plurality of cell sheets for dividing the filter into the plurality of cells, each cell sheet having integral horizontal shoulders protruding from each side and extending the length for supporting the porous filter plates, each cell sheet having integral foot means for attaching the cell

sheet to the base of the filter, each cell sheet having a plurality of holes evenly spaced along the length thereof above the shoulder for attaching a filter plate holding means and each cell sheet having a plurality of holes spaced along each vertical edge thereof for attaching the cell sheets to the ends of the filter;

b. a plurality of port means attached to one end of the cell sheets and connecting the cell sheets at one end thereof and providing ports between the filtrate receiving means and the effluent channel, each port means comprising a rectangular front panel having a plurality of circular openings, a rectangular rear panel having a plurality of circular openings corresponding to the openings in the front panel, a plurality of cylindrical tubes extending from the openings in the front panel to the openings in the rear panel, a reinforcing plate extending from the front panel to the rear panel above each tube, a plurality of horizontal ledges projecting from the front side of the front panel above each circular opening for supporting the porous filter plates, a plurality of pairs of vertical dogs projecting from the front side of each port means, each pair of dogs forming a slot for receiving the ends of the cell sheets and each pair of dogs having a plurality of holes for attaching the cell sheets, the front panel and rear panel also having a tongue at one end thereof and a groove at the other end thereof for attachment to adjacent port means;

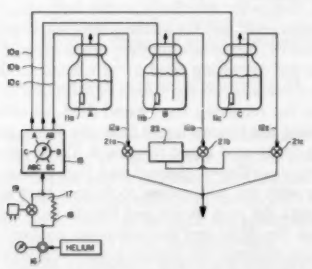
c. plurality of end cell panels attached to the other end of the cell sheet and connecting the ends of the cell sheet together comprising a rectangular panel having a plurality of means extending from the rear side thereof for holding the end cell sheets in the filter tank wall, a plurality of horizontal ledges projecting from the front side of the end cell panel for holding the porous plates, a plurality of pairs of vertical dogs projecting from the front side of each end cell panel, each pair of dogs forming a slot for receiving the ends of the cell sheets and each pair of dogs having a plurality of holes for attaching the cell sheets, and each end cell panel having means at the edges thereof for attachment to adjacent end cell means.

4,133,767

CHROMATOGRAPHIC APPARATUS AND METHOD

Stephen R. Bakalyar, Berkeley, and Ronald E. Honganen, Campbell, both of Calif., assignors to Spectra-Physics, Inc., Mountain View, Calif.

Filed Jun. 14, 1977, Ser. No. 806,457
Int. Cl.² B01D *15/03*
U.S. Cl. 210—31 C **9 Claims**



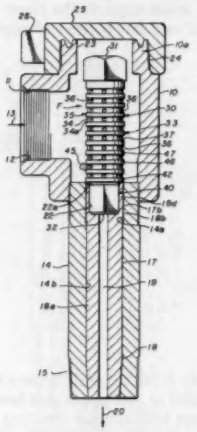
1. In multi-solvent chromatography systems having pumping means for delivering a liquid carrier to a column, the improvement comprising sparging at least one of the solvents before it is supplied to the pumping means with a gas that is inert to the solvent and which has low solubility in the solvent, the sparging being continued for a period of time sufficient to substantially eliminate gases of air from the same and to saturate the solvent with the sparging gas.

4,133,768

FLOW CHOKE FILTER FOR OIL AND GAS WELLS

Joseph G. Theriot, 500 Jupiter St., Morgan City, La. 70380

Filed Mar. 31, 1978, Ser. No. 892,003
Int. Cl.² B01D *35/02*
U.S. Cl. 210—452 **5 Claims**



1. In the flow line of an oil and gas well wherein a flow choke with a sized passage for restricting fluid flow from a well is seated in a housing that has an inlet for conducting well fluids to the inlet of the sized passage of the choke and an outlet for the discharge of fluids from the sized choke passage and housing, the invention of a removable filter for the sized passage of the choke comprising:

a. an elongated hollow body closed at one end and open at the other end for fitting in the housing;

b. said hollow body having an exterior surface along its longitudinal axis in which recesses are formed having a bottom spaced inwardly of said exterior surface to form a longitudinally extending space between and above the bottom of the recesses, the longitudinal space including side surfaces extending upwardly from the bottom surface of the recesses to intersect said exterior surface;

c. therebeing a plurality of openings in the recesses; and

d. surface means on said elongated hollow body for sealably engaging with the flow choke whereby fluid flow from the well is first conducted through the recess openings into said body and then to the sized passage in the flow choke.

4,133,769

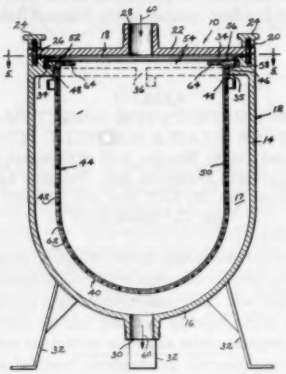
LIQUID FILTER HAVING SELF-RETAINING FILTER BAG

Howard W. Morgan, Jr., Michigan City, Ind., assignor to Filter Specialists, Inc., Michigan City, Ind.

Filed Nov. 25, 1977, Ser. No. 854,482
Int. Cl.² B01D *29/30*
U.S. Cl. 210—455 **14 Claims**

In a liquid filter including a housing having a side wall defining a chamber therein, said chamber having an opening, a cap spanning said chamber opening, a support carried by said housing, a reticulated basket having an opening therein defined by a marginal edge, said basket fitted within said chamber with its marginal edge contacting said support to space said basket from said housing side wall, an inlet port and an outlet port located in liquid flow communication through said basket, the improvement comprising a filter bag having an opening therein defined by a shape-retaining edge portion, said bag opening edge portion including a flexible outturned flange means, said bag fitting in said basket through said basket opening within the path of liquid flow communication between said inlet and

outlet ports, said bag having its opening edge portion overlying said basket marginal edge, said bag flange means engaging



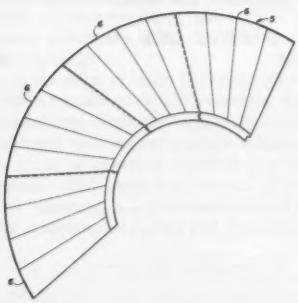
said housing to secure said bag in position within said basket independently of said cap.

4,133,770

SCREEN FOR A BASKET OF A CENTRIFUGAL SEPARATOR

André Mercier, La Madeleine, France, assignor to Fives-Cail Babcock, Paris, France

Filed Nov. 3, 1977, Ser. No. 848,079
Int. Cl.² B01D *29/10*
U.S. Cl. 210—497 FB **1 Claim**



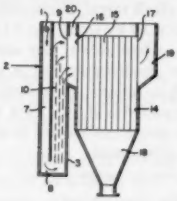
1. A blank which is formed into a replaceable screen insert for a basket of a centifugal separator comprised of a frusto-conical sheet extending between a large and a small base, the frusto-conical screen sheet consisting of several sectors defining a multiplicity of apertures, the disposition of the apertures being the same for all the sectors of the screen sheet, the screen sheet being divided into successive zones defined by concentric circles extending in planes parallel to the bases, the apertures in the successive zones differing from each other, the apertures in a first one of the zones adjacent the small base being round holes defining a small percentage of apertured area with respect to the total area of the first zone, the apertures in the zones succeeding the first zone being slits inclined with respect to a median generatrix of the respective sector, the angle of inclination of the slits increasing from zone to zone towards the large base, and all the slits in the same zone and sector having the same inclination.

4,133,771

APPARATUS FOR BRINGING ABOUT PARTICLE GROWTH IN A FLOWING LIQUID SUSPENSION

Jacob Pielkenrood, Krommenie, Netherlands, assignor to Pielkenrood-Vinitex B.V., Assendelft, Netherlands

Continuation of Ser. No. 559,132, Mar. 17, 1975, abandoned, which is a continuation of Ser. No. 353,543, Apr. 23, 1973, abandoned. This application Mar. 18, 1976, Ser. No. 667,962
The portion of the term of this patent subsequent to Aug. 3, 1993, has been disclaimed.
Int. Cl.² B01D *21/00*
U.S. Cl. 210—513 **9 Claims**



1. Apparatus for separating suspended particles from a flowing carrier fluid, comprising in combination:

a coalescence device including a vessel having a supply duct connected to a source of particle-bearing flowing fluid, having a discharge opening through which the particle-bearing fluid emerges from said vessel, and having at least one stationary plate attached to the inside of said vessel intermediate said supply duct and said discharge opening defining in association with said vessel a velocity gradient generating fluid passage in which the direction of fluid flow is reversed at least once, said passage comprising at least two vertically-elongated chambers in serial communication, each chamber being defined by generally vertically-extending surfaces including a pair of opposite walls disposed in a preselected spaced-apart relationship so that predetermined velocity gradients are generated in the fluid flowing through each of said chambers due to frictional contact with the walls of said chambers, said predetermined velocity gradients having a predetermined magnitude sufficiently large to promote coalescence of the particles but not so large as to cause disintegration of the coalesced particles; and,

a separator device including a separator vessel having a supply opening connected with the discharge opening of said coalescence device and receiving flowing fluid from it, having a plurality of spaced-apart substantially parallel plates positioned within it, said plates mounted at a slope relative to a vertical plane and defining a plurality of parallel passages through which the fluid flows, the space between the plates being sufficiently small to cause the coalesced particles to separate from the flowing carrier fluid and to be deposited on said plates, said separator vessel having a discharge opening through which the flowing carrier fluid is discharged.

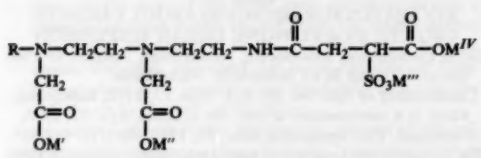
4,133,772

AQUEOUS DETERGENT COMPOSITIONS CONTAINING AMPHOTERIC SURFACTANTS HAVING ANTI-MICROBIAL AND PRESERVATIVE PROPERTIES

Saul Kaplan, Teaneck; John J. Merianos, Jersey City, both of N.J.; Harold A. Green, Havertown, Pa., and Alfonso N. Petrocci, Glen Rock, N.J., assignors to Kewanee Industries, Inc., Bryn Mawr, Pa.

Division of Ser. No. 799,697, May 23, 1977, Pat. No. 4,076,744. This application Nov. 3, 1977, Ser. No. 848,071
Int. Cl.² C11D *1/10, 1/84, 3/48*
U.S. Cl. 252—106 **11 Claims**

1. An aqueous mixture of a compound having the structure:



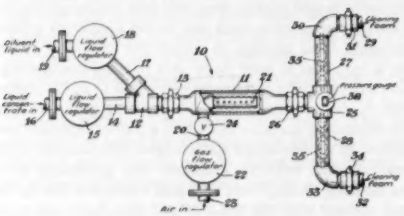
where R is an alkyl group of from 8 to 14 carbon atoms, and where M′, M″, M‴, and M^{IV} may be the same or different and constitute monovalent moieties selected from the group consisting of hydrogen, alkali metal, ammonium ion, and ammonium ion that is substituted by from 1 to 3 lower alkyl groups, each of from 1 to 3 carbon atoms, and wherein each of said alkyl groups is either unsubstituted or is substituted by one hydroxyl group, with an anionic surfactant, wherein the concentration of the compound is at least 7½% by weight, and the concentration of the anionic surfactant is no greater than the concentration of the compound.

4,133,773

APPARATUS FOR MAKING FOAMED CLEANING SOLUTIONS AND METHOD OF OPERATION

Bobby G. Simmons, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 28, 1977, Ser. No. 819,748
Int. Cl.² B08B 9/00; B01J 13/00
U.S. Cl. 252—359 E **4 Claims**



1. An apparatus for making a foamed fluid useful for cleaning the interior surfaces of a vessel, which comprises:
   - a first conduit which defines a foam chamber;
   - a second conduit which communicates with the foam chamber, and which defines an inlet adapted for carrying a liquid concentrate into the foam chamber;
   - a third conduit which communicates with the foam chamber, and which defines an inlet adapted for carrying a diluent liquid into the foam chamber, the diluent liquid thereby mixing with the liquid concentrate to form a liquid solution in the foam chamber;
   - a first flow regulator means installed in the second conduit, and adapted for regulating the flow of the liquid concentrate into the foam chamber;
   - a second flow regulator means installed in the third conduit, and adapted for regulating the flow of the diluent liquid into the foam chamber;
   - a fourth conduit having a gas disperser section connected into one end, the fourth conduit being in communication with the foam chamber, the gas disperser section being positioned inside the foam chamber, and the fourth conduit defining an inlet adapted for carrying a gas into the foam chamber, the gas thereby being dispersed in the liquid solution to form a foamed fluid;
   - a third flow regulator installed in the fourth conduit, and adapted for regulating the flow of the gas into the foam chamber;
   - a fifth conduit which connects into the foam chamber, and which has at least one open end, the said open end being spaced from the foam chamber and adapted for connection into a discharge line which carries the foamed fluid to a vessel to be cleaned; and
   - a mixing device which is positioned in the fifth conduit and is adapted for final mixing of the foamed fluid.

4,133,774

PROCESS FOR PREPARING DIRECT IMAGING PRESSURE FIXABLE MAGNETIC TONERS

Carl Brynko, and Carl G. Brynko, both of Oakland, N.J., assignors to Reprographic Materials, Inc., Pompton Lakes, N.J.

Filed Sep. 29, 1977, Ser. No. 837,693
Int. Cl.² G03G 9/08
U.S. Cl. 252—62.1 D **12 Claims**

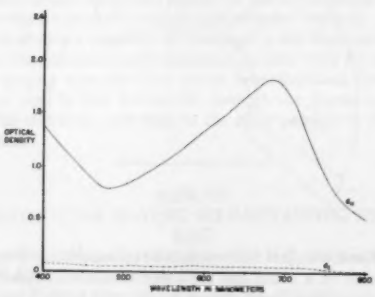
1. A process for preparing direct imaging, pressure fixable particulate magnetic toners which process is carried out in an aqueous medium and comprises dispersing a particulate magnetic material in the aqueous medium; adding a pressure-sensitive adhesive organic resin; adding a surfactant and agglomerating agent to agglomerate the magnetic material and pressure-sensitive adhesive and form a barrier layer over the agglomerate particles; adding a strengthening resin emulsion to the aqueous agglomerate-containing medium and encapsulating the agglomerate particles and barrier layer to provide a strengthening coat over the barrier layer; and adding an emulsion of a conductive material to provide an outer conductive layer on the strengthening coat.

4,133,775

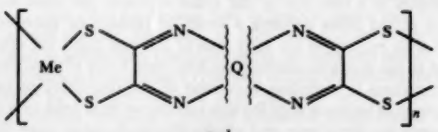
DICHROIC LIGHT POLARIZERS STAINED WITH METAL CHELATES

Stanley M. Bloom, Waban, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 641,936, Dec. 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 474,042, May 28, 1974, abandoned. This application Feb. 4, 1977, Ser. No. 765,642
Int. Cl.² G02B 5/30
U.S. Cl. 252—300 **30 Claims**



1. A dichroic light polarizer comprising a sheet of molecularly oriented, transparent linear polymer having incorporated therein an oligomeric metal chelate stain having a repeating structural formula selected from



and

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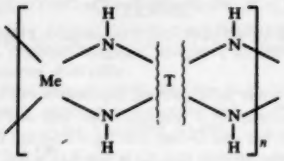


wherein Me is a metal of the first, second or third transition metal series, and may be the same or different for separate repeating units of the oligomeric stain, Q and T are bridging groups allowing said units to metal chelate at both ends, each Q and T being independently selected from the group consisting of homocyclic aromatic rings, heterocyclic aromatic rings, fused rings, rigidly connected rings and rigidly connected fused rings and n is a whole number between 2–10, inclusive.

4,133,776

MANUFACTURE OF POLYFUNCTIONAL COMPOUNDS

Roy L. Pruett, and Wellington E. Walker, both of Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 666,613, Mar. 15, 1976, abandoned, which is a continuation of Ser. No. 470,114, May 15, 1974, abandoned, which is a division of Ser. No. 219,130, Jan. 19, 1972, Pat. No. 3,833,634, which is a continuation-in-part of Ser. No. 210,538, Dec. 21, 1971, abandoned. This application Oct. 14, 1977, Ser. No. 842,366

Int. Cl.[2] B01J *31/20, 31/22, 31/24*

U.S. Cl. 252—431 N 9 Claims

1. The catalyst composition for preparing a polyhydric alcohol by the conversion of a mixture consisting essentially of an oxide of carbon and hydrogen to said alcohol, which catalyst is a rhodium carbonyl complex formed in the presence of said mixture at a temperature of between 100° and 375° C. and at a pressure of between 500 to 50,000 psig of said oxides of carbon and hydrogen.

2. The composition of claim 1 wherein the rhodium is complexed with a mixture of carbon monoxide, hydrogen, and an organic ligand compound, said organic ligand compound coordinates with said rhodium and contains at least one atom which possesses a pair of electrons which form a coordinate body with rhodium, which atom is at least one of Lewis base nitrogen, Lewis base oxygen and mixtures thereof and the remainder of said compound is carbon and hydrogen.

4,133,777

HYDRODESULFURIZATION CATALYST

James A. Frayer, Pittsburgh; Henri K. Lese, Monroeville; Joel D. McKinney, Pittsburgh; Kirk J. Metzger, Pittsburgh, and John A. Paraskos, Pittsburgh, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jun. 28, 1977, Ser. No. 810,810

Int. Cl.[2] B01J *21/04, 21/06, 23/84*

U.S. Cl. 252—465 12 Claims

1. A hydrodesulfurization catalyst comprising Group VI and Group VIII metals with a promoting amount of Group IV-B metal on a non-cracking support, said promoting amount being between 1 and 10 weight percent based on the total weight of the catalyst, the particles of said catalyst comprising elongated extrudates which show in cross-section at least one groove defining protrusions and an average concavity index between 1.01 and 1.35, the shortest distance between the depth of said at least one groove and the center in said cross-section being between 1/30 and 1/20 inch.

4,133,778

ELECTRODE WITH LANTHANUM-CONTAINING PEROVSKITE SURFACE

Thomas J. Gray, Halifax, Canada, assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 677,875, Apr. 19, 1976, Pat. No. 4,076,611. This application Feb. 21, 1978, Ser. No. 879,164

Int. Cl.[2] H01B *1/08*

U.S. Cl. 252—517 20 Claims

1. The method for preparing a perovskite electrode for the electrolysis of aqueous brine, wherein said electrode is comprised of an electroconductive substrate and a perovskite surface of the empirical formula

$$A\,A'\,BO_3$$

wherein the atomic ratio of A:A′ is in the range from about 0.05:1 to about 0.95:1 and wherein the valence of A + A′ + B = 6, said method comprising:

A. admixing

1. an oxide of lanthanum to provide said A component,
2. a compound of an alkaline earth metal to provide said A′ component, wherein said alkaline earth metal is selected from the group consisting of
   (a) alkaline earth metal oxides,
   (b) alkaline earth metal carbonates,
   (c) alkaline earth metal hydroxides, and mixtures thereof, and
3. an oxide of a transition metal to provide said B component, wherein said transition metal is selected from the group consisting of

(a) cobalt,
(b) chromium,
(c) tungsten,
(d) molybdenum,
(e) manganese,
(f) iron,
(g) nickel,
(h) rhenium,
(i) uranium, and
(j) mixtures thereof,

B. firing the resulting mixture to effect formation of said perovskite composition,

C. reducing the particle size of said perovskite composition to pass through a 325 mesh screen,

D. compressing the finely divided perovskite particles into a desired electrode form, and

E. firing the resulting compressed perovskite electrode at a temperature above about 1100° C. to effect binding of said perovskite particles.

4,133,779

DETERGENT COMPOSITION CONTAINING SEMI-POLAR NONIONIC DETERGENT AND ALKALINE EARTH METAL ANIONIC DETERGENT

James A. Hellyer, Milford; David S. Lambert, and Robert Mermelstein, both of Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 538,618, Jan. 6, 1975, abandoned, and Ser. No. 634,389, Nov. 24, 1975, abandoned. This application Mar. 23, 1976, Ser. No. 669,531

Int. Cl.[2] C11D *1/83, 1/12, 1/75*

U.S. Cl. 252—547 20 Claims

1. A detergent composition especially effective in removing greasy soils consisting essentially of a mixture of:

(a) a water-soluble amine oxide having one alkyl or hydroxy alkyl moiety of 8 to 28 carbon atoms and two alkyl moieties selected from the group consisting of alkyl groups and hydroxy alkyl groups of 1 to 3 carbon atoms;

(b) a magnesium salt of an anionic detergent selected from the group consisting of (1) linear alkyl benzene sulfonates having 9 to 15 carbon atoms in the alkyl group, (2) alkyl sulfates having 8 to 22 carbon atoms, (4) olefin sulfonates

having 8 to 22 carbon atoms, (5) alkyl ether sulfates having 8 to 22 carbon atoms in the alkyl group and 1 to 30 ethylene oxide units, (6) alkyl glyceryl ether sulfonates having 8 to 22 carbon atoms in the alkyl group and (7) mixtures thereof in a weight ratio of amide oxide to anionic detergent of from 1:100 to 1:2; and

(c) the balance selected from the group consisting of water, mixtures of water and C_1-C_5 alkanols, and inert filler salts.

4,133,780

POLYURETHANE FOAMS PREPARED FROM CONDENSATION PRODUCTS OF AMINES, EPIHALOHYDRINS AND ALKYLENE OXIDES

Richard A. Moore; Louis C. Pizzini, both of Trenton, and John T. Patton, Jr., Wyandotte, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 610,142, Sep. 4, 1975, abandoned. This application Jun. 14, 1977, Ser. No. 806,567

Int. Cl.[2] C08G *18/32*

U.S. Cl. 521—167 **5 Claims**

1. A polyurethane cellular foam prepared by the reaction of an organic polyisocyanate and an oxyalkylated product in which the proportionate amounts of polyisocyanate and the oxyalkylated product provide an NCO/OH ratio from about 0.9:1 to 1.2:1, and in which the oxyalkylated product is prepared by the addition of an alkylene oxide selected from the group consisting of ethylene oxide, propylene oxide, butylene oxide, styrene oxide, allyl glycidyl ether, and mixtures thereof, to a condensation product in an amount sufficient to or greater than the amount necessary to react with all of the active hydrogens in the condensation product, said condensation product prepared by reacting in the presence of an alkaline catalyst at least 2 moles of an amine selected from the group consisting of aliphatic, olefinic, aromatic, alicyclic, alkyl aryl, alkyl alicyclic, alkyl heterocyclic and heterocyclic primary amines and secondary polyamines and alkanolamines with 1 mole of epihalohydrin and having a molecular weight from about 600 to about 10,000.

4,133,781

SMOKE-RETARDANT POLYISOCYANURATE FOAM

Kaneyoshi Ashida, Hiratsuka; Masaaki Ohtani, Kawasaki; Takashi Yokoyama, Tokyo, and Shoichi Ohkubo, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Aug. 24, 1977, Ser. No. 827,258

Claims priority, application Japan, Sep. 6, 1976, 51-106532

Int. Cl.[2] C08J *9/00*

U.S. Cl. 521—154 **14 Claims**

1. A smoke-retardant polyisocyanurate foam which contains an organosilicate having hydroxypolyoxyalkylene group which is obtained by reacting a polyoxyalkyleneglycol with at least one of metalic silicon, halosilicon compounds and lower alkyl silicates wherein the amount of said organosilicate having hydroxypolyoxyalkylene group is in a range of 2 to 30 wt.% to the foam.

4,133,782

SOMATOSTATIN ANALOGS WITH DISSOCIATED BIOLOGICAL ACTIVITIES

Wylie W. Vale, Jr.; Jean E. F. Rivier, both of La Jolla, and Marvin R. Brown, San Diego, all of Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Continuation-in-part of Ser. No. 693,282, Jun. 7, 1976, abandoned. This application Apr. 7, 1977, Ser. No. 785,533

Int. Cl.[2] C08L *37/00*; C07C *103/52*

U.S. Cl. 260—8 **20 Claims**

1. A peptide selected from those of the formulae:

I

Ala-Gly-Cys-Lys-X_1 -Phe-Phe-X_2 -Lys-Thr-Phe-Thr-X_3 -X_4

-continued

Ala-Gly-Cys-Lys-X_1 -Phe-Phe-X_2 -Lys-Thr-Phe-Thr-X_3 -X_4 II

and

R-Ala-Gly-Cys- (R^1) -Lys (R^2)-(X_1) -Phe-Phe-(X_2) -Lys (R^3)-Thr-(R^4) -Phe-Thr (R^5) -(X_3) -(R^6) -(X_4) (R^7) -(X_5). III

and the non-toxic salts thereof, wherein X_1 is selected from Asn and des-Asn; X_2 is selected from Trp and D-Trp; X_3 is selected from Ser and D-Ser; and X_4 is selected from Cys and D-Cys with the proviso that X_1 is des-Asn when X_2 is D-Trp, X_3 is Ser and X_4 is Cys; X_3 is D-Ser when X_1 is Asn and X_4 is Cys; and X_4 is D-Cys when X_1 is Asn and X_3 is Ser; R is selected from the class consisting of H and an alpha-amino protecting group; R^1 and R^7 are selected from the group consisting of H and a protecting group for Cys selected from S-p-methoxybenzyl, S-p-methylbenzyl, S-acetamidomethyl, S-trityl and S-benzyl; R^2 and R^3 are selected from the group consisting of H and a side chain amino protecting group for Lys selected from the group consisting of benzyl, chlorobenzyloxycarbonyl, benzyloxycarbonyl, tosyl, t-amyloxycarbonyl, t-butyloxycarbonyl, R^4, R^5 and R^6 are selected from the group consisting of H and a hydroxyl protecting group selected from the group consisting of acetyl, benzoyl, tert-butyl, trityl, benzyl and benzyloxycarbonyl; with the proviso that at least one of R, R^1, R^2, R^3, R^4, R^5, R^6 and R^7 is other than hydrogen; and X_5 is selected from the group consisting of hydroxy, methoxy, esters, amides, hydrozides, -O-CH_2-polystyrene resin support and O-CH_2-benzyl-polystyrene resin support.

4,133,783

THERMOSETTING CELLULOSE ESTER POWDER COATING COMPOSITION

Richard J. Brewer; Peter M. Grant, and Robert B. Taylor, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 519,180, Oct. 30, 1974, abandoned. This application Jun. 23, 1976, Ser. No. 699,022

Int. Cl.[2] C08B *3/18, 3/22*; C08L *1/14*; C08J *3/12*

U.S. Cl. 260—15 **8 Claims**

1. A thermosetting coating composition in the form of a powder having an average particle size of between about 10 and about 300 microns comprising:

(a) cellulose acetate butyrate having an acetyl content of from 0 to about 15% by weight, a butyryl content of from about 35 to about 55% by weight, a hydroxyl content of from about 0.5 to about 3.0% by weight and a viscosity of from about 0.05 to about 1.0 second,

(b) from about 10 to about 25 phr by weight of a platicizer for said cellulose acetate butyrate,

(c) from about 2 to about 10 phr by weight of a hexaalkoxymethylmelamine crosslinking agent wherein the alkoxy group contains from 1 to 20 carbon atoms, and

(d) from about 0.1 phr to about 3.0 phr by weight of the reaction product of an aromatic sulfonic acid and a compound containing at least one oxirane group.

4,133,784

BIODEGRADABLE FILM COMPOSITIONS PREPARED FROM STARCH AND COPOLYMERS OF ETHYLENE AND ACRYLIC ACID

Felix H. Otey, and Richard P. Westhoff, both of Peoria, Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sep. 28, 1977, Ser. No. 837,491

Int. Cl.[2] C08L *3/00, 3/04*

U.S. Cl. 260—17.4 ST **21 Claims**

1. A flexible, self-supporting, and biodegradable film composition comprising a dry composite of a starchy material and a water-dispersible ethylene acrylic acid (EAA) copolymer.

4,133,785

PROCESS FOR PREPARING A FILM-FORMING MATERIAL

Bruce C. Henshaw, Mount Waverley, and Frederick J. Lubbock, Beaumaris, both of Australia, assignors to Dulux Australia Ltd., Melbourne, Australia

Filed Jan. 17, 1975, Ser. No. 542,019
Claims priority, application Australia, Feb. 1, 1974, 6440/74
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—22 CB 3 Claims

1. A process of preparing a liquid film-forming dispersion with particles of 2 microns maximum size by the stages of:

(a) adding a mixture of at least two copolymerisable α, β-ethylenically unsaturated monomers at least 10–19% by weight of which mixture is acrylonitrile, to a solution of a 60–70% oil length drying or semi-drying oil modified alkyd resin comprising 1.0 – 4.0% by weight of itaconic acid in a first hydrocarbon liquid of aniline point 35° – 45° C, at a concentration such that monomer mixture comprises 35 – 55% of the total weight of the monomers and alkyd resin, and then reacting the monomers with the alkyd resin at 100°– 135° C in the presence of a free radical polymerisation initiator which is not a peroxide or a hydroperoxide;

at the completion of the reaction, diluting the reaction mixture with a second hydrocarbon liquid until the final aniline point of the resulting hydrocarbon liquid mixture in which the reaction product is dissolved is 40°–50° C; and then

(c) cooling the mixture at such a rate that there is formed a stable dispersion of polymer particles of size 2 micron maximum.

4,133,786

ACRYLATE-MODIFIED ALKYD RESIN

Robert R. Harris, Burnham, and Warren J. Pollack, Carpentersville, both of Ill., assignors to International Minerals & Chemical Corp., Libertyville, Ill.

Filed Oct. 5, 1977, Ser. No. 839,717
Int. Cl.[2] C09D *3/66, 5/02*
U.S. Cl. 260—22 CB 22 Claims

1. An ammonia neutralized aqueous dispersion of a water-soluble acrylic-modified alkyd resin, said resin obtained by the process consisting of the steps of (a) forming an alkyd resin having excess hydroxy groups by reacting at elevated temperatures a fatty acid having 10–20% conjugated unsaturation and an aromatic dicarboxylic acid or anhydride and dimethylolpropionic acid with an excess amount of a polyol, and (b) reacting at elevated temperatures the alkyd resin so formed with acrylic or methacrylic acid or ester thereof or mixture thereof.

4,133,787

WATER SOLUBLE POLYESTER RESIN

Deno Laganis, Schenectady, and Paul M. Begley, Scotia, both of N.Y., assignors to Schenectady Chemicals, Inc., Schenectady, N.Y.

Division of Ser. No. 795,907, May 11, 1977, Pat. No. 4,105,639. This application Feb. 2, 1978, Ser. No. 874,516
Int. Cl.[2] C08L *67/02*
U.S. Cl. 260—29.2 E 36 Claims

1. A solution of a thermosetting polyester in water or water containing a water miscible polar solvent, said polar solvent being present in an amount up to 30%, said solution also containing an amine and an organic titanate which is hydrolytically stable as a curing agent for the polyester, said polyester having a molecular weight of 800 to 1300, an OH/COOH ratio of 1.8:1 to 3:1 and being prepared from reactants consisting essentially of

(1) (a) an aromatic dicarboxylic acid with 0 to 50% based on the total dicarboxylic acid of a cycloaliphatic dicarboxylic acid,

(b) tris(2-hydroxyethyl)isocyanurate or an aliphatic polyhydric alcohol containing at least three hydroxyl groups,

(c) a primary dihydric alcohol,

(d) a monohydric alcohol, or

(2) (a), (b) and (c), the molar ratio of (c) to (b) being from 75:25 to 40:60 when (d) is not present and the molar ratio of (c) plus (d) to (b) when (d) is present being 75:25 to 40:60.

4,133,788

POLYMER LATEX WHICH IS CROSS-LINKED WITH A DIALKYL TIN DIACRYLATE IN THE PREPARATION OF GRAFTED COPOLYMERS

Ved K. Sahajpal, Br Oudorp, NH, Netherlands; Larry D. Sarver, New Martinsville, W. Va., and Claude C. Deegan, Belpre, Ohio, assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Jan. 23, 1978, Ser. No. 871,298
Int. Cl.[2] C08L *51/04*
U.S. Cl. 260—29.7 UP 14 Claims

1. A process for preparing a graft copolymer of styrene and methyl methacrylate as a superstrate grafted on a copolymer of butadiene and styrene as the substrate, which graft copolymer is compatible with vinyl chloride polymers, comprising:

(a) preparing a polymer latex by polymerizing butadiene or a mixture of butadiene and styrene, in the presence of a small proportion of a dialkyl tin diacrylate cross-linking agent;

(b) adding to said latex a mixture of methyl methacrylate and styrene; and

(c) polymerizing said mixture of (b).

4,133,789

ADHESIVE COMPOSITION FOR BONDING A LOW-ENERGY PLASTIC SURFACE TO METAL

Pallavoor R. Lakshmanan, Houston, Tex., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Nov. 3, 1977, Ser. No. 848,284
Int. Cl.[2] C08L *93/00;* C09J *1/02, 3/26, 5/00*
U.S. Cl. 260—27 EV 39 Claims

1. An adhesive composition effective in bonding a low-energy plastic surface to metal which provides an improved tensile lap shear strength consisting essentially of: (1) about 20 to about 55 weight percent of an ethylene-vinyl ester copolymer having from about 9 to about 35 weight percent of a vinyl ester, said vinyl ester having 2 to 4 carbon atoms; (2) about 25 to about 40 weight percent of a tackifier selected from the group consisting of (a) a rosin, (b) a rosin ester, (c) a terpene resin, (d) a terpene-phenolic resin and (e) a rosin-modified phenolic resin; (3) about 0.25 to about 5 weight percent of a silane having a structural formula:

$$R(CH_2)_n[NH(CH_2)_3]_mSiX_3$$

wherein R is selected from the group consisting of amino, mercapto, glycicoxylpropyl, epoxycyclohexyl, methacryloxy and vinyl; n is an integer from 0 to 6; m, when R is amino, is an integer from 0 to 1; m, when R is selected from the group consisting of mercapto, glycidoxylpropyl, epoxycyclohexyl, methacryloxy and vinyl is the integer 0; and X is selected from the group consisting of Cl, OCH_3, OC_2H_5 and $OC_2H_4OCH_3$; and (4) about 5 to about 54.75 weight percent of a wax.

4,133,790

AIR DRYING THERMOSETTING AQUEOUS EPOXY-ACRYLIC COPOLYMER COATING SYSTEMS

Kazys Sekmakas, Chicago; Raj Shah, Schaumburg, and John F. DeRossi, Zion, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Dec. 20, 1976, Ser. No. 752,805
Int. Cl.[2] C08J *3/06;* C08L *33/02*
U.S. Cl. 260—29.6 NR 10 Claims

1. A method of providing a thermosetting aqueous epoxy

resin-acrylic copolymer coating system adapted to cure on air drying comprising providing a mixture in water consisting essentially of a first component constituted by acid-neutralized organic solvent soluble tertiary amine copolymer of copolymerized monomers comprising at least about 40% of nonreactive monoethylenic monomer, from 5–35% of monoethylenic hydroxy-functional monomer, and from 5–35% of monoethylenic tertiary amine monomer selected from the group consisting of esters and amides of monoethylenic carboxylic acids, said copolymer being in solution in a water-miscible inert organic solvent, and a second component constituted by a resinous polyepoxide in solution in at least partially water-miscible organic solvent.

4,133,791

PROCESS FOR THE PREPARATION OF AQUEOUS ETHYLENE COPOLYMER DISPERSIONS WITH HIGH VISCOSITIES WHICH CONSISTS ESSENTIALLY OF POLYMERIZING IN THE PRESENCE OF POLYVINYL ALCOHOL AND MIXING WITH CERTAIN POLYALKYLENE GLYCOLS

Christof Kemenater, and Gerhard Bade, both of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Nov. 7, 1977, Ser. No. 849,500

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1976, 2659545

Int. Cl.² C08L *29/04*

U.S. Cl. 260—29.6 WA **11 Claims**

1. A process for the preparation of an aqueous ethylene-containing copolymer dispersion with viscosities above 20 Pas (measured with a Brookfield viscosimeter at 10 rpm) which consists essentially of (1) polymerizing an aqueous monomer mixture of ethylene and at least one monomer copolymerizable with ethylene under conventional ethylene copolymerization conditions in the presence of from 1% to 15% by weight of polyvinyl alcohol with a degree of hydrolyzation of 70% to 100% and in the absence of polyalkylene oxides to a solids content of from 30% to 60% by weight, to give a copolymer dispersion, (2) evenly distributing from 1% to 8% by weight of water-soluble polyalkylene glycols having a molecular weight of between 6,000 and 100,000 selected from the group consisting of polyethylene glycol and mixtures of polyethylene glycol/polypropylene glycol, in said copolymer dispersion, and (3) recovering said aqueous ethylene-containing copolymer dispersion with viscosities above 20 Pas.

4,133,792

RESIN SOLUTIONS OF ACETYLENE CONTAINING POLYAMIDE ACIDS

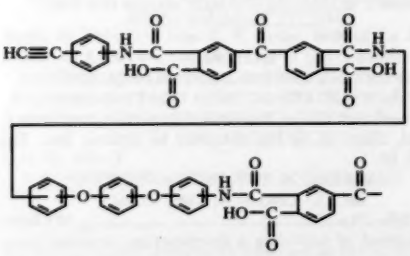
Patricia A. Antonoplos, and William J. Heilman, both of Houston, Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed May 9, 1977, Ser. No. 794,902

Int. Cl.² C08G *73/12*

U.S. Cl. 260—30.2 **5 Claims**

1. A thermosetting resin composition consisting essentially of a chemical compound having the structure:



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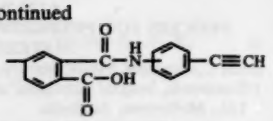


said resin composition having a solubility of at least 30 weight % in N-methyl-2-pyrrolidone at 25° C., said resin composition containing no detectable concentration of imide groups as evidenced by an NMR spectrum.

4,133,793

COMPOSITIONS CONTAINING NOVEL METHACRYLIC POLYMERS HAVING ALLYL FUNCTIONALITY

Sheldon N. Lewis, Willow Grove, and Richard A. Haggard, Fort Washington, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 517,334, Oct. 23, 1974, Pat. No. 4,059,616, which is a continuation-in-part of Ser. No. 371,921, Jun. 20, 1973, abandoned, which is a continuation-in-part of Ser. No. 137,057, Apr. 23, 1971, abandoned. This application Sep. 6, 1977, Ser. No. 830,717

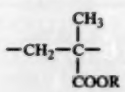
Int. Cl.² C08F *20/10, 20/26, 20/40*

U.S. Cl. 260—31.2 R **20 Claims**

1. A curable composition comprising

(A) an initiator;

(B) an alkoxide-polymerized addition homopolymer or copolymer of an ester of methacrylic acid wherein the polymer comprises mers having the formula



wherein R is a (C_2–C_4) alkenyl group, an allyloxyalkyl group having up to 12 carbon atoms, or an allyloxyalkoxyalkyl group having up to 12 carbon atoms,

and, optionally, mers derivable from other anionically copolymerizable monomers, and wherein n, the average chain length of the polymer is about 6 to 50 mers; the polymerization being carried out, in the presence of an alcohol and a catalytic amount of an alkoxide, using controlled rates of addition of at least one of the ester, the alcohol and the alkoxide; and

(C) optionally, a pigment.

4,133,794

POLYESTER PLASTICIZERS

Frank Lamb, Oldham, England, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Aug. 6, 1975, Ser. No. 602,340

Claims priority, application United Kingdom, Aug. 22, 1974, 36885/74

The portion of the term of this patent subsequent to Dec. 19, 1995, has been disclaimed.

Int. Cl.² C07C *69/34;* C08K *5/11, 5/12;* C08L *27/06*

U.S. Cl. 260—31.6 **10 Claims**

1. A compound having the formula

$$M(P)_a(D)_\beta(L)_cM \qquad I$$

in which M is the residue of one or more aliphatic monocarboxylic acids containing from 4 to 12 carbon atoms or one or more saturated straight or branched chain monohydric alcohols containing from 4 to 12 carbon atoms, P is the residue of one or more saturated straight or branched chain aliphatic diols containing from 2 to 4 carbon atoms, D is the residue of one or more aliphatic dicarboxylic acids containing from 4 to 6 carbon atoms, or the residue of one or more such acids with a proportion not exceeding 10 mole % of the total acids used, of one or more aromatic dicarboxylic acids or anhydrides

selected from the group consisting of o-phthalic acid, phthalic anhydride and isophthalic acid, L is the residue of 6-hydroxycaproic acid, each of the residues being joined together by ester linkages, residues P, D and L being distributed at random throughout the molecule, a, b and c each having a value greater than zero, the amount of residue of hydroxy acid being from 10 mole % to 90 mole %, based on the total number of moles of reactants, and the molar ratios of the remaining reactants being chosen so that the average molecular weight of the product is from 500 to 1400, which is prepared by reacting in one-step a mixture of the following components (a) from 10 to 90 mole % of epsilon caprolactone or the corresponding hydroxyacid, (b) a hydroxylic component which comprises one or more saturated straight or branched chain aliphatic diols containing from 2 to 4 carbon atoms, (c) an acidic component which comprises one or more aliphatic dicarboxylic acids containing from 4 to 6 carbon atoms or one or more such acids with a proportion not exceeding 10 mole % of the total acids of one or more aromatic dicarboxylic acids or anhydrides selected from the group consisting of o-phthalic acid, phthalic anhydride and isophthalic acid, and (d) one or more aliphatic monocarboxylic acids containing from 4 to 12 carbon atoms or one or more saturated straight or branched chain monohydric alcohols containing from 4 to 12 carbon atoms such that the ratio of monofunctional component to difunctional component is from 93.5 mol % to 220 mol % and such that the hydroxylic components are used in stoichiometric amounts or up to 20% excess over the stoichiometric amounts related to the acidic components.

10. A composition comprising (a) a thermoplastic polymer selected from the group consisting of poly(vinyl chloride) and poly(vinyl chloride) copolymers and (b) a plasticizing amount up to 60% by weight of the plasticized composition of a compound according to claim 1.

4,133,795

CREPE SOLES

Glenn R. Himes, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 27, 1978, Ser. No. 890,112
Int. Cl.[2] C08K *5/01*
U.S. Cl. 260—33.6 AQ **7 Claims**

1. A footwear composition having a simulated crepe appearance comprising:

(a) 100 parts by weight of a block copolymer having at least two monoalkenyl arene polymer end blocks A and at least one elastomeric conjugated diene mid block B, each block A having an average molecular weight between about 5,000 and about 125,000 and each block B having an average molecular weight between about 15,000 and about 250,000, said blocks A comprising 8–65% by weight of the copolymer;

(b) about 5 to about 125 parts by weight of a crystal grade polystyrene;

(c) about 5 to about 175 parts by weight of a hydrocarbon extending oil;

(d) about 5 to about 150 parts by weight of a non-hygroscopic, finely divided filler; and

(e) about 5 to about 50 parts by weight of a synthetic fiber selected from the group consisting of polyamide fibers, polyester fibers, acrylic fibers, and mixtures thereof;

wherein the various components are melt blended at a temperature below the melting point of said synthetic fiber.

4,133,796

HIGH TEMPERATURE RESISTANT HOT MELT SEALANT

Allan R. Bullman, Bernardsville, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Nov. 17, 1977, Ser. No. 852,482
Int. Cl.[2] C08L *9/00;* **C09J** *3/14*
U.S. Cl. 260—37 EP **15 Claims**

1. Hot melt sealant composition comprising:

(A) about 5 to about 50 percent by weight of an ethylene copolymer selected from the group consisting of: (a) ethylene/vinyl acetate copolymers having a melt index of about 1 to about 500 dg./min. containing about 3 to about 40 percent by weight of vinyl acetate copolymerized therein and (b) ethylene/alkyl acrylate or methacrylate copolymers having a melt index of about 1 to about 500 dg./min. containing about 3 to about 35 percent by weight of an alkyl acrylate or methacrylate copolymerized therein wherein the alkyl group contains about 3 to about 6 carbon atoms;

(B) about 5 to about 50 percent by weight of a rubber or elastomer;

(C) about 5 to about 50 percent by weight of at least one alkyl substituted phenolic resin;

(D) about 2 to about 40 percent by weight of an epoxy resin containing at least 2 epoxy units per molecule; and

(E) about 20 to about 70 percent by weight of filler, all based on the weight of the total composition.

4,133,797

MINERAL-FILLED, HIGH IMPACT POLYOLEFIN MOLDING COMPOSITIONS

Michael R. Tirpak, Maywood; James J. Schouten, Glen Ellyn, and Charles E. Green, Brookfield, all of Ill., assignors to The Richardson Company, Des Plaines, Ill.

Continuation of Ser. No. 493,794, Aug. 1, 1974, abandoned. This application Aug. 4, 1976, Ser. No. 711,051
Int. Cl.[2] C08K *3/34*
U.S. Cl. 260—42.46 **51 Claims**

1. A thermoplastic molding composition suitable for forming articles having high heat stability with high impact resistance at low temperature consisting essentially of a blend of an elastomeric polymer of 1-olefins and a thermoplastic polyolefin containing a finely divided feldsparic anhydrous alumino silicate, said elastomeric polymer being present in an amount of from about 10 weight percent to about 20 weight percent.

4,133,798

FLUOROCOPOLYMER COMPOSITION HAVING IMPROVED TRANSPARENCY

Hiromichi Nishimura, and Masahiko Ichimura, both of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Jan. 13, 1978, Ser. No. 869,273
Claims priority, application Japan, Jan. 19, 1977, 52-4005
Int. Cl.[2] C08K *5/01, 5/04*
U.S. Cl. 260—45.7 R **6 Claims**

1. A fluorocopolymer composition having improved transparency and high ultraviolet absorbancy, which comprises

100 wt. parts of a fluorocopolymer having a tetrafluoroethylene component and an ethylene component in a molar ratio of C_2F_4/C_2H_4 of 60:40 to 40:60;

0.05 to 20 wt. parts of a condensed ring compound selected from the group consisting of anthracenes, phenanthrenes, anthraquinones, phenanthrenequinones, substituted derivatives thereof and mixtures thereof; and

optionally up to 30 mole percent of another comonomer component; wherein the heat melt temperature of said fluorocopolymer is 260° to 360° C.; and wherein said condensed ring compound has a boiling point higher than 250° C., is not decomposed at the fabrication temperature

of said fluorocopolymer and is miscible with said fluorocopolymer.

4,133,799

BENZOFURANYLPHENOL STABILIZERS

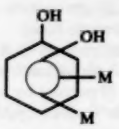
Robert W. Layer, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 573,819, May 2, 1975, Pat. No. 4,054,551. This application Apr. 29, 1977, Ser. No. 792,292

Int. Cl.[2] C08G 8/06, 8/22; C08K 5/13, 5/15

U.S. Cl. 260—45.8 A 7 Claims

1. A stabilized composition comprising (A) 100 parts by weight of an organic material subject to the deleterious effects of oxygen, heat, and light and (B) from about 0.1 part to about 10 parts by weight of the product of a process comprising (1) reacting glyoxal with a dihydroxylated compound in the presence of an acidic catalyst at a temperature from about 0° C. to about 100° C. the molar ratio of glyoxal to dihydroxylated compound present during reaction being from about 1/10 to about 10/1, said dihydroxylated compound having the formula



wherein each M is hydrogen, halogen, or an alkyl group containing 1 to 8 carbon atoms, and (2) thereafter hydrolyzing the step (1) reaction product with an acidic or basic catalyst.

4,133,800

POLYESTER PRODUCTION

Robert P. L. V. Taubinger, Hertford, and Robert B. Rashbrook, Hatfield, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 541,695, Jan. 16, 1975, abandoned. This application Nov. 15, 1976, Ser. No. 742,000

Claims priority, application United Kingdom, Jan. 28, 1974, 3831/74

Int. Cl.[2] C08G 63/36

U.S. Cl. 260—45.7 PH 3 Claims

1. In a process for the production of a linear aromatic polyester which comprises:

(a) esterifying at least one aromatic dicarboxylic acid with ethylene glycol at an elevated temperature and in the presence of an alkali metal hydroxide;

(b) polycondensing the product of (a), without isolation, under reduced pressure and in the presence of antimony trioxide in amount 100 to 1,000 parts per million by weight of the dicarboxylic acid originally present and triphenyl phosphate stabilizer;

the improvement which comprises carrying out step (a) in the presence of a solution of germanium dioxide in an alkali metal hydroxide and a diol having its hydroxyl groups attached to adjacent carbon atoms, the amount of germanium dioxide being 10 to 200 parts per million by weight based on the amount of dicarboxylic acid present at the start of the reaction and the amount of the alkali metal hydroxide is at least one equivalent per mole of the germanium dioxide, said antimony trioxide being added to the product of (a) after completion of the esterification reaction and the amount of said alkali metal hydroxide is:

(i) greater than the equivalent per mole of germanium dioxide;

(ii) greater than 0.5 gram equivalents per million grams of the dicarboxylic acid;

(iii) less than the greater of twice the equivalent per mole of germanium dioxide and 2.5 gram equivalents per million grams of the dicarboxylic acid.

4,133,801

PROCESS FOR THE PREPARATION OF POLYESTERS

Yasuo Morimatsu; Toshio Tanaka, both of Matsuyama; Nobuya Okumura, and Takeshi Horiuchi, both of Ehime, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Jan. 19, 1978, Ser. No. 870,703

Claims priority, application Japan, Jan. 26, 1977. 52-6852

Int. Cl.[2] C08G 63/30

U.S. Cl. 528—230 7 Claims

1. A process for the preparation of polyesters which comprises reacting a di-lower alkyl (1–4 carbon atoms) ester of a dicarboxylic acid at least 90 mol % of which consists of terephthalic acid with an alkylene glycol having from 2 to 10 carbon atoms at least 90 mol % of which consists of ethylene glycol or tetramethylene glycol and thereafter polycondensing an obtained di-glycol ester of the dicarboxylic acid and/or a low molecular weight condensate thereof, in the presence of (A) a lower alkyl (1–4 carbon atoms) p-formylbenzoate in an amount of about 50 to about 1000 ppm, (B) a di-lower alkyl (1–4 carbon atoms) isophthalate in an amount of about 50 to about 1000 ppm and (C) p-toluic acid and/or a mono-lower alkyl (1–4 carbon atoms) terephthalate in an amount of more than about 30 ppm, wherein the total amount of the compounds (A), (B) and (C) is not more than about 2000 ppm.

4,133,802

META-XYLYLENE DIAMINE/ALIPHATIC DICARBOXYLIC ACID POLYAMIDE FILM

Makoto Hachiboshi; Koichi Matsunami; Hikoichi Nagano, all of Otsu; Hiroshi Ieki, and Tsutomu Oko, both of Inuyama, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 454,931, Mar. 26, 1974, abandoned, which is a continuation-in-part of Ser. No. 205,172, Dec. 6, 1971, abandoned. This application Jan. 21, 1977, Ser. No. 760,848

Int. Cl.[2] C08G 69/46

U.S. Cl. 528—502 12 Claims

1. A biaxially drawn film of a polyamide which is produced by subjecting an undrawn film of polyamide to simultaneous or stepwise biaxial drawing at a temperature within a range as calculated according to the following inequality in the case of simultaneous drawing:

$$-10W + 120 + 12 \log (\delta/1000) > T \geqq -6W + 80$$

or according to the following inequality in the case of stepwise drawing:

$$-10W + 130 + 7 \log (\delta/1000) > T \geqq -6W + 80$$

wherein W is the moisture content in % by weight of the undrawn film, δ is the speed in % per minute and T is the drawing temperature in ° C., said polyamide containing not less than 70 mole % of repeating units of an α,δ-aliphatic dicarboxylic acid having 6 to 10 carbon atoms and metaxylylendiamine or a mixture of metaxylylenediamine and paraxylylenediamine, the amount of paraxylylenediamine present in the polyamide being not more than 30 mole % of the total amount of metaxylylenediamine and paraxylylenediamine, the balance of said polyamide being units of a polyamide-forming monomer copolymerizable with said repeating units.

4,133,803

POLYOXYPROPYLENE POLYAMINE POLYAMIDE THERMOPLASTIC ADHESIVES

Howard P. Klein, Austin, Tex., assignor to Texaco Development Corp., New York, N.Y.

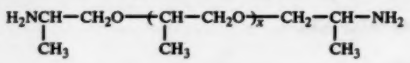
Continuation-in-part of Ser. No. 622,311, Oct. 14, 1975, abandoned. This application Oct. 20, 1976, Ser. No. 734,068

Int. Cl.[2] C08G 69/26

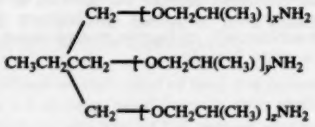
U.S. Cl. 528—340 7 Claims

1. A thermoplastic adhesive consisting essentially of a polyamide reaction product of a polyoxypropylene polyamine

having an average molecular weight of about 190–3000, and having a structural formula as follows:



wherein x is an integerr from 1 to 40 or



where x, y and z represent integers in the range of about 1 to 15, and the sum of x, y and z is from 3 to about 50; and an aliphatic or aromatic hydrocarbon dicarboxylic acid, ester or anhydride having from 2 to 30 carbon atoms, said polyamide reaction product being prepared by mixing and reacting said polyoxypropylene polyamine and said carboxylic acid, ester or anhydride at a temperature of from about 175° C. to about 270° C.

4,133,804

POLYPEPTIDE POSSESSING THYMIC ACTIVITY

Jean-Francois Bach, and Jean Hamburger, both of Paris, France, assignors to Institut National de la Sante et de la Recherche Medicale (Inserm), Paris, France

Continuation-in-part of Ser. No. 454,493, Mar. 25, 1974, abandoned. This application Sep. 22, 1976, Ser. No. 725,594

Int. Cl.[2] **C07G** *15/00*

U.S. Cl. 260—112 R **3 Claims**

1. A method of producing a polypeptide hormone having thymic activity which comprises:

(a) dialyzing defibrinated blood serum under ultrafiltration conditions through a polyacrylonitrile membrane having a permeability of 0.36 to 0.45 ml./min./mm^2/mm Hg pressure,

(b) passing the dialyzate through an Amicon UM2 filter membrane which allows passage of molecules of less than 1000 molecular weight, and collecting the material retained by the filter membrane,

(c) chromatographing the filter-retained material through Sephadex G-25 and eluting with 0.2M phosphate buffer at pH 7.3,

(d) desalting said eluate and chromatographing the desalted product in phosphate buffer at pH 6.3 on carboxymethylcellulose and eluting with a NaCl gradient,

(e) chromatographing said eluate through Sephadex G-25 and eluting with 5% acetic acid,

(f) chromatographing said eluate through Sephadex G-10 and eluting with water.

4,133,805

CYCLIC UNDECAPEPTIDES RELATED TO SOMATOSTATIN AND INTERMEDIATES THEREFOR

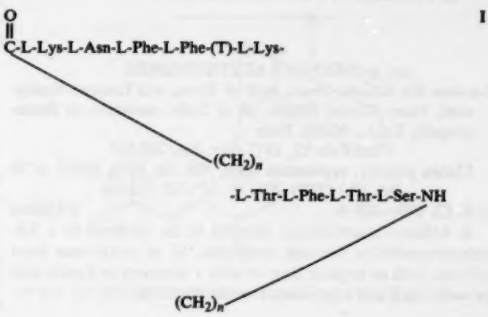
John P. Yardley, King of Prussia, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Dec. 16, 1975, Ser. No. 641,218

Int. Cl.[2] **C07C** *103/52;* **A61K** *37/00*

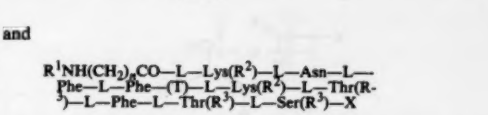
U.S. Cl. 260—112.5 S **7 Claims**

1. A compound selected from the class consisting of

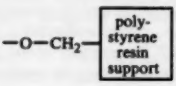


I

and



and its non-toxic salts wherein R^1 is selected from the group consisting of hydrogen and t-butyloxycarbonyl; R^2 is 2-chlorobenzyloxycarbonyl; R^3 is benzyl; n is an integer of from 3 to 8; T is selected from the group consisting of L-Tryptophyl and D-Tryptophyl; and X is selected from the group consisting of OH, NH—NH_2, O-(lower)alkyl, O-benzyl and an anchoring bond linked to a solid polystyrene resin represented by:



4,133,806

AZO DYES WITH AN N-SUBSTITUTED 2-HYDROXY-3-CYANO-4-METHYL PYRRIDONE-6-COUPLING COMPONENT

Gerhard Gnad, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

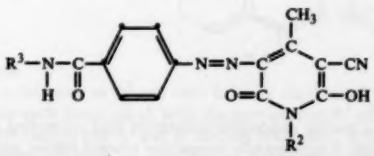
Continuation of Ser. No. 25,253, Apr. 2, 1970, abandoned. This application Jun. 3, 1974, Ser. No. 475,491

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1969, 1917278

Int. Cl.[2] **C09B** *29/36;* **D06P** *1/18, 3/26, 3/54*

U.S. Cl. 260—156 **4 Claims**

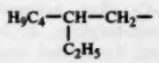
1. An azo dye of the formula



wherein:

R^2 is alkyl of 1 to 4 carbon atoms or is ethyl or propyl substituted by hydroxy, methoxy, ethoxy, propoxy or butoxy; and

R^3 is C_4H_9—, $CH_3OCH_2CH_2$—CH_2—, $CH_3(CH_2)_4$—, $CH_3(CH_2)_5$—, $CH_3(CH_2)_7$—,



or cycloalkyl of 5 to 8 carbon atoms.

4,133,807

4-THIOXO-2-AZETIDINONES

Luciano Re; Alberto Brant, both of Rome, and Luciano Bassignani, Passo Corese (Rieti), all of Italy, assignors to Snamprogetti, S.p.A., Milan, Italy

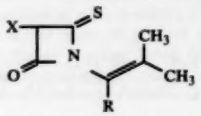
Filed Feb. 17, 1977, Ser. No. 769,527

Claims priority, application Italy, Feb. 23, 1976, 20457 A/76

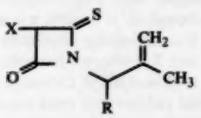
Int. Cl.[2] C07D *205/10, 205/08, 513/04*

U.S. Cl. 260—239 A **6 Claims**

1. 4-thioxo-2-azetidinone adapted to be cyclized to a 5,6-dehydropenicillin through treatment, in an anhydrous inert solvent, with an organic base or with a Bronsted or Lewis acid or with heat, and represented by the formula:



or



wherein X is a member of the group consisting of benzylamino, triphenylmethylamino, phenylacetamido, phenoxyacetamido and phthalimido, and R is a member of the group consisting of carboxyl, carboxylic salts, carboxylic amides, carboxylic esters and carboxylic thioesters.

4,133,808

4-(FORMYLTHIO)AZETIDINONES AND OZONIZATION PROCESS THEREFOR

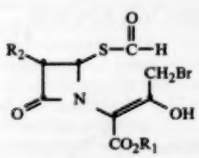
Robin D. G. Cooper, and Douglas O. Spry, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 626,946, Oct. 29, 1975, Pat. No. 4,048,157. This application May 10, 1977, Ser. No. 795,463

Int. Cl. C07d *205/08, 403/12, 403/04*

U.S. Cl. 260—239 A **7 Claims**

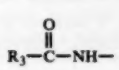
1. A process for preparing a compound of the formula



wherein:

R_1 is a readily removable carboxylic acid protecting group which is substantially unreactive toward ozone; and

R_2 is phthalimido or a group having the formula

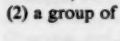


wherein:

R_3 is

(1) hydrogen, C_1-C_3 alkyl, halomethyl, benzyloxy, 4-nitrobenzyloxy tert.-butyloxy, 2,2,2-trichloroethoxy, 4-methoxybenzyloxy, 4-protected amino-4-protected carboxybutyl in which the amino protecting group and carboxy protecting group are substantially unreactive toward ozone; or

(2) a group of the formula



wherein:

m is 0 or 1; and

R_4 is phenyl or phenyl substituted with 1 or 2 halogens, nitro, cyano, trifluoromethyl, C_1-C_4 alkyl, C_1-C_2 alkoxy, protected hydroxy in which the hydroxy protecting group is substantially unreactive toward ozone; or

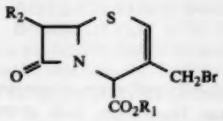
(3) a group of the formula

wherein:

R_4 is as defined above and

W is protected hydroxy, protected carboxy, or protected amino in which the hydroxy protected group, the carboxy protecting group and the amino protecting group are substantially unreactive toward ozone;

comprising the steps of reacting ozone with a compound of the formula



in an unreactive solvent at a temperature ranging from −100 to about 0° C. to form an intermediate ozonide, and reacting the ozonide with a mild reducing agent.

4,133,809

4H-S-TRIAZOLO[4,3-2][1,5]BENZODIAZEPIN-5-ONES

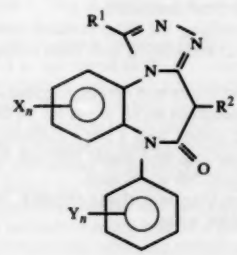
B. Richard Vogt, Yardley, Pa., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 365,012, May 29, 1973, abandoned. This application Mar. 17, 1977, Ser. No. 778,823

Int. Cl.[2] C07D *487/14*

U.S. Cl. 260—239.3 T **4 Claims**

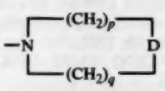
1. A compound of the formula



wherein

R^1 is 2-, 3- or 4-pyridyl,

R^2 is H; alkyl of 1-4 carbons optionally substituted by amino, mono-lower alkyl amino, di-lower alkyl amino, cyclic imines of formula



where D is methylene, oxygen or $N-R^{10}$ and where p and q are the same or different and are the integers 1, 2, and 3 provided that p + q is at least 1; hydroxy; alkoxy of 1–6 carbons or

where R^5 is alkyl of 1–5 carbons optionally substituted by phenyl or X-substituted phenyl; or R^5 is phenyl optionally substituted by 1 or more X-substituents,

X and Y are the same or different and are hydrogen, F, Cl, Br, trifluoromethyl, alkyl of from 1–6 carbons, alkoxy of from 1–6 carbons, nitro, cyano, amino, alkanoylamino of 1–4 carbons, alkylthio of 1–6 carbons, alkylsulfinyl of 1–6 carbons or alkyl sulfonyl of 1–6 carbons;

R^{10} is hydrogen, alkyl of 1–4 carbons or phenyl optionally substituted by X, wherein X is as defined above;

and n is 0, 1 or 2.

4,133,810

PROCESS FOR THE RECOVERY OF ε-CAPROLACTAM FROM A REACTION MIXTURE OF ε-CAPROLACTAM AND SULFURIC ACID

Willem J. Wassen, and Rudolf L. Zwart, both of Geleen, Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Jan. 20, 1978, Ser. No. 871,005

Claims priority, application Netherlands, Jan. 28, 1977, 7700882

Int. Cl.² C07D *201/16*

U.S. Cl. 260—239.3 A **1 Claim**

1. In processes for the recovery of ε-caprolactam from reaction mixtures of ε-caprolactam and sulfuric acid, in which the sulfuric acid, after complete or partial neutralization with simultaneous formation of an ammonium salt, is separated from the lactam and an organic solvent is used to form a solution of lactam in the organic solvent from which the lactam is later recovered, the improvement consisting essentially in that said neutralized sulfuric acid is at least partially subjected to thermal decomposition to form a gaseous mixture containing ammonia and sulfur dioxide, contacting this gaseous mixture with water to form an aqueous solution containing ammonium sulfite and/or ammonium hydrogen sulfite, and to liberate an ammonia-free sulfur dioxide gas, thereafter using this aqueous sulfite solution, either as such or after being mixed with partially neutralized sulfuric acid that has not been subjected to the thermal decomposition, for the neutralization of the said reaction mixture of lactam and sulfuric acid, while the sulfur dioxide formed in this neutralization and/or said mixing is recycled to a synthesis plant wherein the sulfur dioxide is oxidised to sulfur trioxide.

4,133,811

13-ALKYLTHIO (AND ARYLTHIO)-11,17-EPOXY-17-METHYL-18-NORANDROSTENES

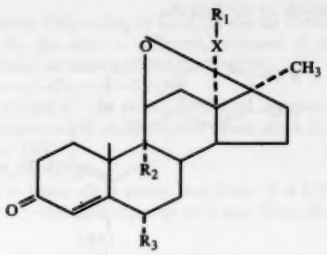
Ravi K. Varma, Belle Mead, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 17, 1978, Ser. No. 879,015

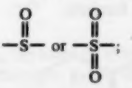
Int. Cl.² C07J *17/00, 31/00*

U.S. Cl. 260—239.55 R **17 Claims**

1. A steroid having the formula



or the 1,2-dehydro derivative thereof, wherein X is —S—,



R_1 is alkyl, phenyl or phenyl substituted with one or two alkyl, alkoxy or halogen substituents; R_2 is hydrogen or halogen; R_3 is hydrogen, fluorine or methyl; and wherein the terms "alkyl" and "alkoxy" refer to groups having 1 to 10 carbon atoms.

4,133,812

PROCESS FOR PRODUCING BENZO (A) QUINOLIZINE DERIVATIVES

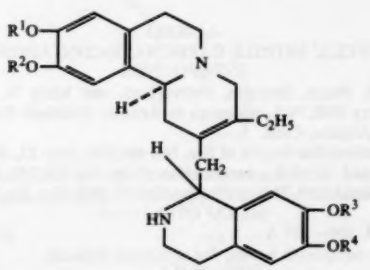
Csaba Szaantay; Jaanos Rohaaly, and Istvaan Jelinek, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

Continuation of Ser. No. 634,274, Nov. 21, 1975, abandoned, which is a continuation-in-part of Ser. No. 372,425, Jun. 21, 1975, abandoned. This application Apr. 25, 1977, Ser. No. 790,538

Int. Cl.² C07D *455/08*

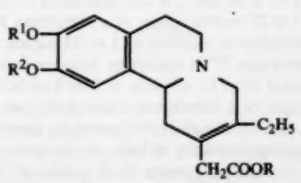
U.S. Cl. 546—96 **2 Claims**

1. A process for preparing a compound of the formula:

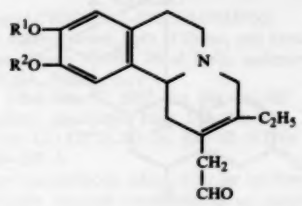


wherein

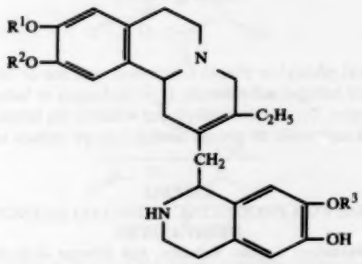
R^1 is the same as R^2 and each is lower alkyl and R^3 and R^4 are each lower alkyl, with the proviso that R^1 and R^2 are not methyl and R^3 and R^4 are not both ethyl, which comprises the steps of: reducing an unsaturated ester of the formula



wherein R is a lower alkyl with diisobutyl-aluminum-hydride to an aldehyde of the formula:



and condensing the compound thus obtained with β-(3-hydroxy-4-lower alkoxy-phenyl)-ethyl amine and alkylating the compound of the formula:



thus obtained.

4,133,813

CYCLIC NITRILE CARBONATE-CONTAINING COMPOUNDS

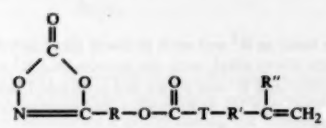
Karl E. Fuger, Ettingen, Switzerland, and Ming N. Sheng, Cherry Hill, N.J., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 696,994, Jun. 17, 1976, abandoned, which is a continuation of Ser. No. 595,249, Jun. 17, 1975, abandoned. This application Oct. 6, 1976, Ser. No. 730,058

Int. Cl.[2] C07D *273/00*

U.S. Cl. 260—307 A **22 Claims**

1. A compound having the structural formula:



wherein T is O, S, or NR'''', R is a substituted or unsubstituted alkylene of 1 to 20 carbon atoms, or a phenylene, R' is a substituted or unsubstituted alkylene of 1 to 12 carbon atoms, carbonyl or phenylene, R'' is hydrogen, halogen or a substituted or unsubstituted alkyl or alkylene of 1 to 8 carbon atoms and R'''' is hydrogen, or a substituted or unsubstituted alkyl of 1 to 8 carbon atoms, wherein the substituents are compatible members of the group consisting of halo, amido, amino, urea, thiourea, nitro, nitrile, C_3–C_{12} ester, C_3–C_{12} ether, C_3–C_{12} ketone, C_3–C_{12} thioester, C_3–C_{12} thioether, and C_3–C_{12} thioketone.

4,133,814

2-PHENYL-3-AROYLBENZOTHIOPHENES USEFUL AS ANTIFERTILITY AGENTS

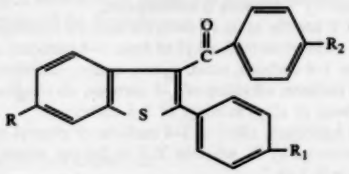
C. David Jones, and Tulio Suarez, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 626,010, Oct. 28, 1975, abandoned. This application Sep. 17, 1976, Ser. No. 724,203

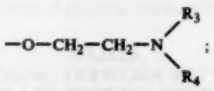
Int. Cl.[2] C07D *409/10, 333/56;* A61K *31/38*

U.S. Cl. 260—326.55 A **10 Claims**

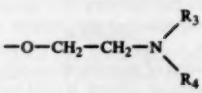
1. A compound of the formula



in which R is hydroxyl; R_1 is hydrogen, hydroxyl, C_1–C_5 alkoxy, or



R_2 is hydrogen; and R_3 and R_4 independently are C_1–C_4 alkyl, or R_3 and R_4 taken together with the nitrogen to which they are bonded constitute a heterocyclic ring selected from the group consisting of pyrrolidino, piperidino, hexamethyleneimino, or morpholino; and pharmaceutically acceptable non-toxic acid addition salts of those compounds in which R_1 is



4,133,815

PREPARATION OF UNSATURATED ALCOHOLS

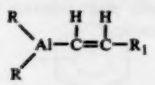
Spencer C. Watson; Dennis B. Malpass, and G. Scott Yeargin, all of La Porte, Tex., assignors to Texas Alkyls, Inc., Deer Park, Tex.

Continuation of Ser. No. 395,888, Sep. 10, 1973, abandoned. This application Mar. 11, 1976, Ser. No. 665,836

Int. Cl.[2] C07D *319/12, 309/04, 307/06*

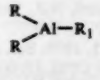
U.S. Cl. 260—340.6 **4 Claims**

1. A process of preparing a stabilized predominantly cis-isomer compound having the following formula:



wherein R can be the same or different and is selected from a straight or branched chain alkyl group having 1 to 6 carbon atoms and R_1 is selected from a straight or branched chain alkyl group having from 1 to 20 carbon atoms, comprising the steps of:

(a) reacting a compound having the following formula:



wherein R and R_1 have been previously defined; with

(b) acetylene at a pressure of between 0 and 15 psig and at a temperature of between −80° C. and ca. 110° C.

(c) stabilizing the reaction product of steps (a) and (b) against degradation to the trans isomer and decomposition reactions by adding and retaining at least a 1 molar equivalent of a Lewis base coordinating agent selected from cyclic ether and cyclic diether.

4,133,816

PREPARATION OF CIS-1-HYDROXY-3-SUBSTITUTED-6,6-DIMETHYL-6,6A,7,8,10,10A-HEXAHYDRO-9H-DIBENZO[b,d]PYRAN-9-ONES AND INTERMEDIATES THEREFOR

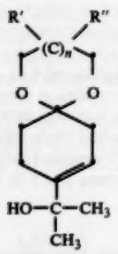
William B. Blanchard, and Charles W. Ryan, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 814,817, Jul. 12, 1977, which is a division of Ser. No. 702,804, Jul. 6, 1976, Pat. No. 4,054,581. This application May 10, 1978, Ser. No. 904,702

Int. Cl.[2] C07D *319/04*

U.S. Cl. 260—340.7 **4 Claims**

1. A ketal of 4-(1-hydroxy-1-methylethyl)-3-cyclohexen-1-one of the general formula



wherein:

n is 1, and

R′ and R″ independently are hydrogen, methyl or ethyl.

4,133,817

11-OXA-PROSTAGLANDIN ANALOGS

Gerhardus J. Lourens, Rand Park Ridge Extn 1, and Johannes M. Koekemoer, Pretoria, both of South Africa, assignors to Chembro Holdings (Proprietary) Limited, Johannesburg, South Africa

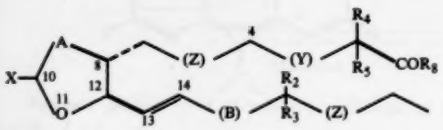
Filed Apr. 29, 1976, Ser. No. 681,742

Claims priority, application South Africa, Apr. 30, 1975, 75/2806

Int. Cl.[2] C07D *317/44, 307/20*

U.S. Cl. 260—340.9 P **10 Claims**

1. A compound of the following formula:

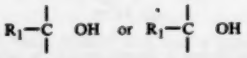


I

wherein

A represents —C═O or α—C . . . OH

B represents



R_1 represents H, lower alkyl or halogen substituted lower alkyl

Z represents CH_2—CH_2 or C═C in the cis configuration

R_2 and R_3, the same or different, represent H or halogen substituted or unsubstituted lower alkyl;

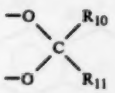
Y is —S—, —O— or —CR_6R_7

R_4, R_5, R_6 and R^7, the same or different, represent H, halogen substituted or unsubstituted lower alkyl or halogen

X is H or OH

R_8 is OR_9 or NR_9R_9

R_9 is H or lower alkyl group, and when X is OH and A is α—C . . . OH then together they may form the group



wherein R_{10} and R_{11}, the same or different, are lower alkyl, hydrogen or a carbocyclic group of 4 to 6 carbon atoms.

4,133,818

PROCESS FOR PRODUCING LACTONES

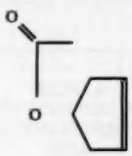
Naresh K. Chadha, Nutley; John J. Partridge, Jr., and Milan R. Uskokovic, both of Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 623,205, Oct. 16, 1975, abandoned, which is a division of Ser. No. 434,539, Jan. 18, 1974, Pat. No. 3,933,892, which is a continuation-in-part of Ser. No. 331,931, Feb. 12, 1973, abandoned. This application Sep. 19, 1977, Ser. No. 834,207

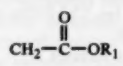
Int. Cl.[2] C07D *307/93*

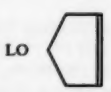
U.S. Cl. 260—343.3 P **4 Claims**

1. A process for preparing an optically active compound of the formula:



its optically active antipode, or a racemate thereof, comprising reacting an optically active compound of the formula:





wherein

forms a hydrolyzable ester group

and —L is an organic sulfonyl leaving group;

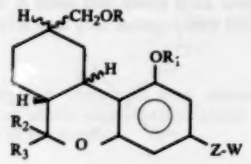
its optically active antipode, or a racemate thereof, with an alkali metal hydroxide in an aqueous medium.

4,133,819
HEXAHYDRO-1-HYDROXY-9-HYDROXYMETHYL-3-SUBSTITUTED-6H-DIBENZO[b,d]PYRANS AS ANALGESIC AGENTS

Michael R. Johnson, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jun. 17, 1977, Ser. No. 807,439
Int. Cl.[2] C07D *311/78;* A61K *31/35*
U.S. Cl. 260—345.3 9 Claims

1. A compound having the formula



wherein

each of R and R_1 is selected from the group consisting of hydrogen and alkanoyl having from one to five carbon atoms;

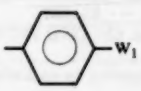
each of R_2 and R_3 is selected from the group consisting of hydrogen and methyl;

Z is selected from the group consisting of

(a) alkylene having from one to ten carbon atoms and

(b) $-(alk_1)_m-O-(alk_2)_n-$ wherein each of (alk_1) and (alk_2) is alkylene having from one to ten carbon atoms, with the proviso that the summation of carbon atoms in (alk_1) plus (alk_2) is not greater than ten; each of m and n is 0 or 1; and

W is



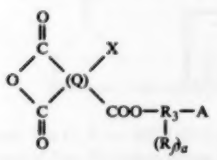
wherein W_1 is selected from the group consisting of hydrogen, fluoro and chloro.

4,133,820
PERFLUOROALKYL MONOESTERS OF ANHYDRIDE 2,3,4,5-TETRAHYDROFURANTETRACARBOXYLIC ACID

Karl F. Mueller, New York, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 646,689, Jan. 5, 1976, Pat. No. 4,058,537.
This application Aug. 29, 1977, Ser. No. 828,460
Int. Cl.[2] C07D *493/04*
U.S. Cl. 260—346.74 7 Claims

1. A compound of formula I



(I)

wherein

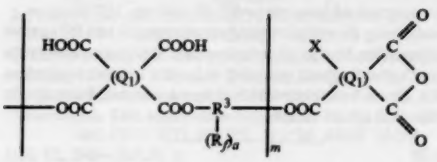
Q is the tetraradical rest of 2,3,4,5-tetrahydrofurantetracarboxylic acid;

X is carboxy;

R_f is perfluoroalkyl of 6 to 18 carbon atoms;

a is 1 or 2;

A is hydrogen or group II;

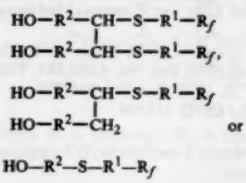


(II);

m is an integer from 0 to 2;

Q_1 is the same as Q, and

R^3 is the residue of an R_f substituted aliphatic alcohol or diol of the structure



where R^1 is a branched or straight chain alkylene of 1 to 12 carbon atoms, alkylenethioalkylene of 4 to 12 carbon atoms, alkyleneoxyalkylene elen of 4 to 12 carbon atoms or alkyleneiminoalkylene of 4 to 12 carbon atoms where the nitrogen atom contains as the third substituent hydrogen or alkyl of 1 to 6 carbon atoms; and

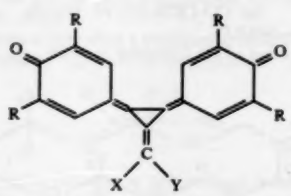
R^2 is straight or branched chain alkylene of 1 to 12 carbon atoms or an alkylenepolyoxyalkylene of the formula $C_nH_{2n}(OC_kH_{2k})_r$ where n is 1 to 12, k is 2 to 6 and r is 1 to 40.

4,133,821
ALKYLIDENEDIQUINOCYCLOPROPANES AND DIARYLCYCLOPROPENES AND METHOD FOR PREPARATION

Robert C. West, Madison, Wis.; Douglas E. Beyer, Midland, Mich., and Koichi Komatsu, Kyoto, Japan, assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Mar. 15, 1977, Ser. No. 777,836
Int. Cl.[2] C07C *49/62, 49/72*
U.S. Cl. 260—396 N 11 Claims

1. An alkylidenediquinocyclopropane having the general formula

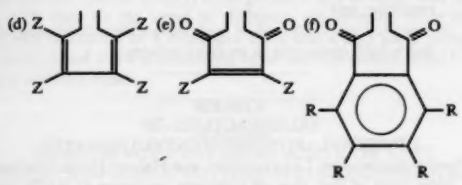


in which X and Y, when identifying separate groups, are selected from the group consisting of

(a) NC (b) COOR

(c) RC—

and, when identifying a single group, is selected from the group consisting of



in which Z is a halogen group and in which R is a group selected from the group consisting of hydrogen, C_1–C_{18} alkyl, cycloalkyl aryl and alkaryl.

4,133,822

HYDROGENATION OF UNSATURATED FATTY ACID

John M. Hasman, Berea, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed Jul. 13, 1977, Ser. No. 815,157
Int. Cl.² C11C *3/12*
U.S. Cl. 260—409 **14 Claims**

1. A process for the hydrogenation of an unsaturated fatty acid which comprises:

subjecting said fatty acid to hydrogenation in a hydrogenation zone with hydrogen gas under hydrogenation conditions comprising a temperature of at least about 150° C. and a gauge pressure of at least about 40 psi in the presence of about 0.025 to about 0.3 weight-percent nickel hydrogenation catalyst and of about 0.5 to about 3 weight-percent copper chromite adjunct catalyst; and

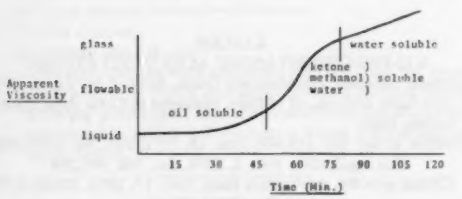
withdrawing resulting hydrogenated fatty acid from said zone.

4,133,823

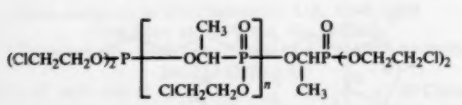
REACTION PRODUCTS OF METAL OXIDES AND SALTS WITH PHOSPHORUS COMPOUNDS

Samuel F. Joyce, III, Baldwin, Mo.; Albert W. Morgan, Collinsville, Ill.; Norman W. Touchette, and William Vanderlinde, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 553,947, Feb. 28, 1975, abandoned, which is a continuation of Ser. No. 223,275, Feb. 3, 1972, abandoned. This application Sep. 17, 1976, Ser. No. 724,192
Int. Cl.² C07F *15/06*
U.S. Cl. 260—439 R **13 Claims**



1. Reaction product of a phosphite/phosphonate of the formula



, wherein n has a value from 0 to 4, and a metal compound selected from the group consisting of a metal oxide and a metal salt.

4,133,824

ORGANO-MAGNESIUM COMPLEXES AND PROCESS FOR THEIR PREPARATION

Dennis B. Malpass, LaPorte, and Joseph H. Merkley, Dayton, both of Tex., assignors to Texas Alkyls, Inc., Deer Park, Tex.

Filed Aug. 17, 1977, Ser. No. 825,370
Int. Cl.² B01J *31/02, 31/12;* C07F *3/02*
U.S. Cl. 260—448 AD **26 Claims**

1. A hydrocarbon soluble organo-magnesium complex of the formula

$$(R_2'Mg)_m \cdot [(RO)_aM]_n$$

wherein R is the group

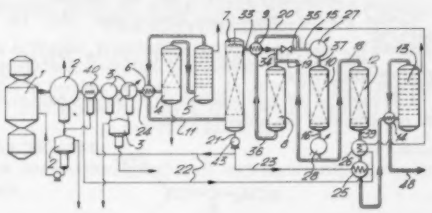
wherein R^2 is a hydrocarbyl group, M is a group IIA or IIIA metal, and a is the integer 2 when M is a group IIA metal and 3 when M is a group IIIA metal; R′ is a primary alkyl group having 1 to 25 carbon atoms, or phenyl group, or mixture thereof, and m and n are numbers such that the ratio of m/n is about one or greater.

4,133,825

PRODUCTION OF SUBSTITUTE NATURAL GAS

Henry J. F. Stroud, Hockley Heath, and Kenneth R. Tart, Dudley, both of England, assignors to British Gas Corporation, United Kingdom

Filed May 11, 1977, Ser. No. 796,024
Claims priority, application United Kingdom, May 21, 1976, 21086/76
Int. Cl.² C07C *27/06*
U.S. Cl. 260—449 M **14 Claims**



1. A process for producing a methane containing substitute natural gas from a primary synthesis gas containing more than 40 percent by volume of carbon monoxide on a dry basis and hydrogen comprising the steps of:

simultaneously heating and saturating said primary synthesis gas with water;

heating the saturated synthesis gas further and dividing the same into first and second feed gas streams;

admixing a recycle gas stream from the product gas of second concurrent shift and methanation reactions with the first feed gas stream and subjecting the admixture to first concurrent shift and methanation reactions over a catalyst at a temperature of from 250° to 550° C.;

mixing the product of the first reactions with said second feed gas stream and effecting second concurrent shift and methanation reactions on said mixture over a second catalyst at a temperature of from 250° to 550° C.;

dividing the product of the second reactions into a second product gas stream and said recycle gas stream; and

subjecting said second product gas stream to a carbon dioxide removal process.

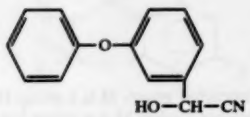
4,133,826
NOVEL INVERSION PROCESS

Julien Warnant, Neuilly-sur-Seine; Jacques Marechal-Prost, Paris, and Philippe Cosquer, Saint-Denis, all of France, assignors to Roussel UCLAF, Paris, France

Filed Apr. 22, 1977, Ser. No. 789,774
Claims priority, application France, Apr. 23, 1976, 76 12094
Int. Cl.[2] C07C *121/75*
U.S. Cl. 260—465 D 25 Claims

1. A process for the preparation of an ester of a chiral (A) acid and (S) α-cyano-3-phenoxybenzyl alcohol comprising reacting an ester of chiral (A) acid with α-cyano-3-phenoxybenzyl alcohol of the formula

B



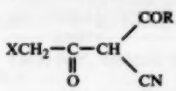
in its optically active (R) form or a racemic (R,S) mixture or a mixture of esters of said (R) alcohol and (S) alcohol in non-equimolecular proportions with a base selected from the group consisting of ammonium hydroxide, primary, secondary and tertiary amines, quaternary ammonium compounds, liquid amines of high molecular weight, ion exchange resins of a basic character and a catalytic amount of a strong base in at least one solvent in which the ester of the (R) alcohol is soluble and in which the ester of the (S) alcohol is insoluble and recovering from the resulting medium the chiral (A) acid ester of the (S) alcohol which is insoluble.

4,133,827
PROCESS FOR THE PRODUCTION OF α-CYANO-γ-HALOACETOACETIC COMPOUNDS

Karl-Josef Boosen, Erlach, Switzerland, assignor to Lonza Ltd., Gampel, Switzerland

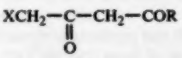
Filed May 13, 1977, Ser. No. 796,808
Claims priority, application Switzerland, May 13, 1976, 6017/76
Int. Cl.[2] C07C *120/00;* C07D *295/18, 211/16*
U.S. Cl. 260—465.4 14 Claims

1. Process for the production of an α-cyano-γ-halo acetoacetic compound of the general formula:

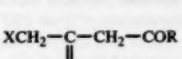


wherein X is halogen R is $—NR_1R_2$, $—NHR_3$ or —O—R_4, R_1 *and* R_2 are each alkyl having 1 to 18 carbons, or R_1 and R_2 form a morpholino or piperidino heterocyclic group with the N in $—NR_1R_2$, R_3 is alkyl having 1 to 18 carbon atoms or aryl, and R_4 is alkyl having 1 to 10 carbon atoms or aryl, which comprises:

(a) reacting an alkali metal alcoholate and the haloacetoacetic compound of the formula:



wherein X and R are the same as defined above, a metal salt of the haloacetoacetic compound of the formula:



wherein X are R are the same as defined above and wherein the metal in the metal salt is an alkali metal, resulting; and

(b) reacting said metal salt of said haloacetoacetic compound and a halo cyanogen in an inert solvent.

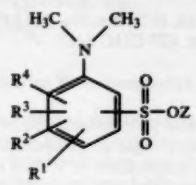
4,133,828
MANUFACTURE OF DIMETHYLAMINOBENZENESULFONATES

Horst Scheuermann, Ludwigshafen, and Helmut Hoch, Wachenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 22, 1976, Ser. No. 707,867
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1975, 2538307
Int. Cl.[2] C07C *143/56, 143/68*
U.S. Cl. 260—508 14 Claims

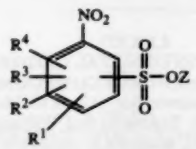
1. A process for the manufacture of dimethylaminobenzenesulfonates of the formula

I



where R^1, R^2, R^3 and R^4 may be identical or different and each is hydrogen or alkyl of 1 to 6 carbon atoms and Z is an alkali metal atom, which process comprises reacting a nitrobenzenesulfonate of the formula

II



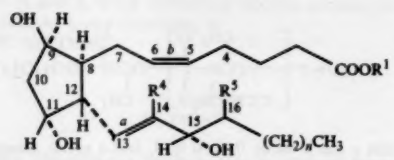
where R^1, R^2, R^3, R^4 and Z have the above meanings, with formaldehyde and hydrogen in the presence of a hydrogenation catalyst consisting essentially of one or more metals of atomic number from 24 to 29 or their oxides, at from 50 to 150° C. and a pressure of not less than 40 bars, in the presence of phosphoric acid and water, at a pH of from 2 to 3.5, and using a reaction time of from 1 to 15 minutes.

4,133,829
8,12-DIISOPROSTANOIC ACID DERIVATIVES

Carmelo Gandolfi; Gianfederico Doria, both of Milan, and Pietro Gaio, Belluno, all of Italy, assignors to Carlo Erba S.p.A., Milan, Italy

Division of Ser. No. 315,460, Dec. 15, 1972, Pat. No. 4,089,896.
This application Feb. 3, 1975, Ser. No. 546,398
Claims priority, application Italy, Dec. 17, 1971, 32520 A/71
Int. Cl.[2] C07C *177/00*
U.S. Cl. 562—503 6 Claims

1.



wherein R^1 is a hydrogen atom, a cation of a pharmaceutically

acceptable base or a C_{1-12} alkyl group, n is 3 or 4, R^4 and R^5, which may be the same or different, are selected from the group consisting of a hydrogen atom and a C_{1-4} alkyl group; double bond a is a trans-double bond and the double bond b is a cis-double bond.

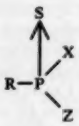
4,133,830

PROCESS FOR PREPARING ALKYL OR ARYL THIOPHOSPHORUS HALIDES AND MIXED ISOMERS THEREOF

Eugene H. Uhing, Pleasantville, and Francis A. Via, Yorktown Heights, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Feb. 4, 1977, Ser. No. 765,705
Int. Cl.[2] C07H *9/34, 9/42*
U.S. Cl. 260—543 P **15 Claims**

1. In a method for preparing compounds of the formula:



wherein R is a C_1 to C_{20} alkyl radical, cycloalkyl of 5–6 carbon atoms in the ring and the C_1-C_4 alkyl substituted derivative thereof, an aralkyl radical of up to two fused rings, the alkyl portion having from 1 to 20 carbon atoms, an aryl radical of up to three fused rings and the C_1-C_4 alkyl derivatives thereof, and biphenyl and the C_1-C_4 alkyl derivatives thereof, X is a halogen of chlorine or bromine, and Z is either R or X, by the reaction of a phosphorus halide source under autogenous pressure in a reaction zone capable of withstanding elevated pressure at a temperature ranging from about 175° to about 450° C., the improvement which comprises recycling in successive runs a by-product of the reaction remaining after separation of the RP(S)XZ product fraction selected from the group consisting of:

(a) a by-product fraction having a boiling point lower than the product fraction;
(b) a by-product fraction having a boiling point higher than the product fraction when said hydrocarbon source is a member selected from the group consisting of RX and RS_nR;
(c) a by-product fraction having a boiling point higher than a product fraction having the formula RP(S)XZ wherein Z is R;
(d) XZP(S)RP(S)XZ;
(e) liquid residue;
(f) solid residue;
(g) mixture thereof; and
(h) mixtures thereof with a member selected from the group consisting of $R_2P(S)X$ and the by-product fraction having a boiling point higher than the product fraction where said hydrocarbon source is RH wherein R and X are as defined hereinbefore.

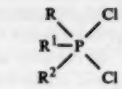
4,133,831

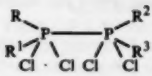
PROCESS FOR CATALYTICALLY PRODUCING PHOSGENE

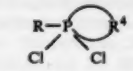
Mitsuo Masaki, Chiba, and Susumu Fuzimura, Ichihara, both of Japan, assignors to UBE Industries, Ltd., Ube, Japan

Filed Mar. 13, 1978, Ser. No. 885,605
Claims priority, application Japan, Mar. 18, 1977, 52-29305
Int. Cl.[2] C07F *9/02*
U.S. Cl. 260—544 K **25 Claims**

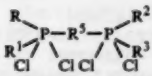
1. A process for catalytically producing phosgene comprising, (a) reacting carbon monoxide with chlorine in a solvent in the presence of a catalyst consisting of at least the phosphine chloride compound selected from the group consisting of compounds of the formulae (1), (2), (3), and (4):


(1),


(2),


(3),

and


(4)

in which formulae R, R^1, R^2, and R^3 respectively represent, independently from each other, a substituted or unsubstituted alkyl group having 1 through 18 carbon atoms or a substituted or unsubstituted cycloalkyl group having 5 through 10 carbon atoms; R^4 represents a substituted or unsubstituted alkylene group having 4 through 6 carbon atoms; and R^5 represents an alkylene group having 1 through 6 carbon atoms or $—CH_2C-H_2O)_{\overline{n}}CH_2CH_2—$wherein n represents an interger of 1,2 or 3; when substituted, the groups R, R^1, R^2, and R^3, independently, comprise a substituent selected from the class consisting of chlorine and fluorine atoms, alkoxyl groups having 1 to 6 carbon atoms and a cyano group; and when substituted, the group R^4 comprises a substituent selected from the class consisting of chlorine and fluorine atoms and alkyl groups having 1 to 6 carbon atoms; and (b) recovering the solution containing the resultant phosgene in said solvent.

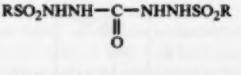
4,133,832

BLOWING AGENTS -BIS(HYDROCARBYLSULFONYL) CARBOHYDRAZIDES

Byron A. Hunter, Woodbridge, and Irwin A. Prager, Waterbury, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 689,448, May 24, 1976, Pat. No. 4,096,100.
This application May 4, 1978, Ser. No. 902,627
Int. Cl.[2] C08J *9/10*
U.S. Cl. 260—554 **9 Claims**

1. A bis(hydrocarbylsulfonyl) carbohydrazide having the formula



wherein R is an alkyl radical having 1 to 12 carbon atoms.

4,133,833

PRODUCTION OF N,N-DI(ETHYL)-META-TOLUAMIDE FROM META-TOLUIC ACID BY LIQUID PHASE CATALYTIC REACTION WITH DIETHYLAMINE

Ezekiel H. Hull, Greensboro, N.C., assignor to Pfizer Inc., New York, N.Y.

Filed Jan. 9, 1978, Ser. No. 868,120
Int. Cl.[2] C07C *103/22, 103/76*
U.S. Cl. 260—558 R **8 Claims**

1. A process for the preparation of N,N-diethyl-meta-toluamide which comprises contacting meta-toluic acid with diethylamine in the liquid phase at a temperature of about 150° C. to 300° C. in the presence of a catalyst in the amount of about 0.0001 to 0.1 gram per gram of said meta-toluic acid,

said catalyst being selected from the group consisting of titanium tetrachloride; $Ti(OA)_4$ wherein the four A moieties may be identical or not and each is selected from the

group consisting of alkyl of from 3 to 18 carbon atoms; triethanolamine titanate chelates; titanium acetylacetonate chelates; tetraoctylene glycol titanate chelates; and titanium lactate ammonium salt chelates, and

the water produced during said contacting being removed from said liquid phase during the course of said preparation.

8. The process of claim 1 wherein said temperature is about 205° C. to 250° C., said preparation is performed at reflux under about atmospheric pressure, and said water is removed from said liquid phase by azeotropic distillation with benzene or toluene.

4,133,834

PROCESS FOR PREPARING α- AND β-HYDROXY OXIMES

Donald Pickens, Mendham, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jan. 3, 1978, Ser. No. 866,421
Int. Cl.[2] C07C *131/00*
U.S. Cl. 260—566 A **20 Claims**

1. In a method for preparing hydroxy oximes which are α-hydroxy oximes or aromatic β-hydroxy oximes by reaction of hydroxylamine with a phenone or acyloin, the improvement which comprises conducting the reaction in the presence of a catalytic amount of an iron ion contributing compound selected from the group consisting of elemental iron and the soluble salts of iron.

4,133,835

PROCESS FOR BI-ORGANIC PEROXIDES

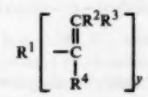
Richard A. Bafford, Tonawanda, and Orville L. Mageli, Kenmore, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Oct. 28, 1968, Ser. No. 771,344
Int. Cl.[2] C07C *179/06*
U.S. Cl. 568—558 **14 Claims**

1. A process for preparing peroxides which process consists essentially of:

(1) reacting an olefin, a reactive organic halide and an organic hydroperoxide, under substantially anhydrous conditions, at a temperature in the range of about 0°-60° C., where

(2) said olefin has the formula:

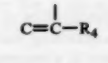


where

(a) y is an integer equal to 1, 2 or 3;

(b) R^1 is a phenyl or naphthalene group;

(c) R^2 and R^3 are each H, alkyl, cycloalkyl, phenyl, or a corresponding halo substituted radical, or R^2 and R^3 join with the common carbon atom to which they are attached or with



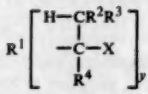
to form a cyclic group;

(d) R^4 is alkyl, cycloalkyl, phenyl, or a corresponding halo substituted radical; and

(e) when R^1 is substituted on more than one ring carbon atom, not more than one ring carbon atom ortho to a

group can be joined to a substituent group;

(3) said reactive organic halide has the formula:



where X is Br or Cl;

(4) said organic hydroperoxide has the formula:

$R^5(-OOH)_y$

where R^5 is an aliphatic or cycloaliphatic hydrocarbon radical, or a corresponding halo substituted radical;

(5) the mole ratio of hydroperoxide groups in said organic hydroperoxide charged to the ethylenic bonds in said olefin charged is 2-1.1 to 1; and

(6) said halide is charged in an amount of about 2-20 mole percent based on olefin charged.

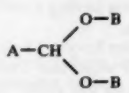
4,133,836

MANUFACTURE OF ACETALS

Axel Nissen, Leimen, and Gerd Kaibel, Lampertheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 31, 1977, Ser. No. 801,561
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1976, 2625074; Apr. 1, 1977, 2714590
Int. Cl.[2] C07C *41/00*
U.S. Cl. 568—596 **6 Claims**

1. In a process for the manufacture of an acetal of the formula

 I

where A is one of the radicals $R^1-CR=CR-$ or $CH_2=CR-CHR-$ and B is one of the radicals $-CRR-CR=CR-R^2$ or $-CRR-CHR-CR=CH_2$, wherein:

R is hydrogen or alkyl of 1 to 4 carbon atoms;

R^1 is hydrogen, alkyl of 1 to 4 carbon atoms or said alkyl substituted by alkoxy of 1 to 4 carbon atoms; and

R^2 is hydrogen or an aliphatic, aliphatic-cycloaliphatic or cycloaliphatic hydrocarbon radical of up to 12 carbon atoms which is saturated or contains up to 4 carbon-carbon double bonds, by reacting 1 molar proportion of an unsaturated aldehyde or aldehyde mixture of the formula

$A-CHO$ II

with at least 2 molar proportions of an unsaturated alcohol or alcohol mixture of the formula

$HO-B$ III,

A and B having the meanings set forth above, in the presence of an acid acetalization catalyst, the improvement which comprises:

carrying out the reaction in the presence of nitric acid as the essential acetalization catalyst under rectifying conditions so that the starting compounds and the nitric acid during the reaction are in the main part of the rectifying column;

discharging water at the top of the column; and

taking off the acetal formed at the bottom of the column.

4,133,837

PREFERENTIAL ALIPHATIC HALOGENATION OF AR-SUBSTITUTED ALKYLBENZENES

Lowell D. Markley, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 738,401, Nov. 3, 1976, Pat. No. 4,087,473. This application Nov. 17, 1977, Ser. No. 852,409

Int. Cl.[2] C07C *25/14*

U.S. Cl. 260—651 R 10 Claims

9. A process for preferential, aliphatic bromination or iodination of a 4-substituted-1-(sec-alkyl)benzene in an isomeric mixture containing (1) a 4-substituted-1-(sec-alkyl)benzene and (2) a 2-substituted-1-(sec-alkyl)benzene, said process comprising the step of contacting the mixture with a suitable brominating or iodinating agent in the presence of an amount of a free radical generator and under conditions sufficient to cause bromination or iodination of the 4-isomer in the alpha position of the 1-sec-alkyl group, whereby essentially none of the 2-isomer is brominated or iodinated.

4,133,838

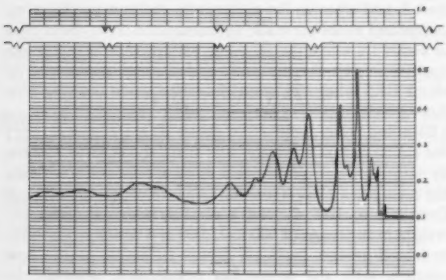
PROCESS FOR PREPARING HYDROCARBONS FROM METHANOL AND PHOSPHORUS PENTOXIDE

Donald E. Pearson, Nashville, Tenn., assignor to Pearson Research Corp., Nashville, Tenn.

Filed May 15, 1975, Ser. No. 577,643

Int. Cl.[2] C07C *1/24*

U.S. Cl. 260—666 P 12 Claims



1. A process for preparing a mixture of hydrocarbons, which comprises; heating a mixture comprising in a molar ratio of from about 1:1 to 1:2.2, phosphorus pentoxide and trimethyl phosphate to a temperature within the range of from about 185° C. to about 300° C.

4,133,839

DEHYDROGENATION WITH A NONACIDIC MULTIMETALLIC CATALYST

John C. Hayes, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 614,402, Sep. 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 434,736, Jan. 18, 1974, Pat. No. 3,909,394, which is a division of Ser. No. 291,138, Sep. 21, 1972, abandoned. This application Sep. 26, 1977, Ser. No. 836,289

Int. Cl.[2] C07C *5/36*

U.S. Cl. 260—666 A 21 Claims

1. A method for dehydrogenating a dehydrogenatable hydrocarbon comprising contacting the hydrocarbon, at dehydrogenation conditions, with a nonacidic catalytic composite consisting essentially of a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum or palladium, about 0.01 to 2 wt. % ruthenium, about 0.01 to about 5 wt. % Group IVA metal and about 0.1 to about 5 wt. % of an alkali metal or alkaline earth metal; wherein the platinum or palladium, ruthenium, Group IVA metal and alkali metal or alkaline earth metal are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum or palladium and ruthenium are present in the elemental metallic state; and wherein substantially all of the Group IVA metal and alkali metal or alkaline earth metal are present in an oxidation state above that of the elemental metal.

4,133,840

PREPARATION OF 4-HOMOISOTWISTANE, (TRICYCLO[5.3.1.0^{3,8}]UNDECANE)

Yoshiaki Inamoto, Wakayama; Kiyoshi Tsuchihashi, Kainan; Naotake Takaishi, and Yoshiaki Fujikura, both of Wakayama, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Division of Ser. No. 734,365, Oct. 20, 1976, Pat. No. 4,086,285. This application Jan. 23, 1978, Ser. No. 871,404

Claims priority, application Japan, Oct. 28, 1975, 50-129507; Nov. 7, 1975, 50-133894

Int. Cl.[2] C07C *13/28*

U.S. Cl. 260—666 PY 6 Claims

1. A process for preparing 4-homoisotwistane, tricyclo[5.3.1.0^{3,8}]undecane; which comprises contacting tricyclo[6.2.1.0^{2,6}]undeca-2(6)-ene with concentrated sulfuric acid having a concentration of from 75 to 100%, at a temperature of from minus 20° to plus 100° C., in the presence of a liquid aliphatic or alicyclic hydrocarbon.

4,133,841

PROCESS FOR UPGRADING EFFLUENTS FROM SYNTHESES OF THE FISCHER-TROPSCH TYPE

Jean Cosyns, Maule; Yves Chauvin, Le Pecq; Bernard Juguin, Rueil Malmaison; Jean-François Le Page, Rueil Malmaison, and Jean Miquel, Paris, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Mar. 25, 1977, Ser. No. 781,277

Claims priority, application France, Mar. 26, 1976, 76 09105; May 21, 1976, 76 15717

Int. Cl.[2] C07C *9/14, 1/04*

U.S. Cl. 260—676 R 9 Claims

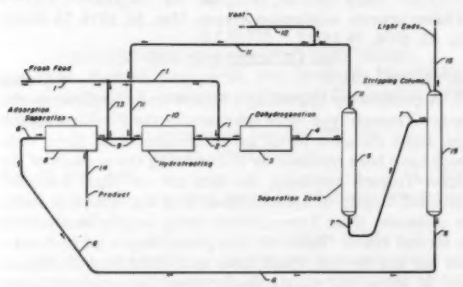
1. A process for upgrading effluents from syntheses of the Fischer-Tropsch type or of substantially the Fischer-Tropsch type, these effluents being generally formed of three cuts, which have been obtained by fractionating the product of the Fischer-Tropsch synthesis, the first cut or "light fraction" comprised largely of hydrocarbons with 3 to 6 carbon atoms per molecule, these hydrocarbons being largely unsaturated, the second cut or "light oil" comprised largely of hydrocarbons the heaviest of which have an ASTM final distillation point of about 300° C, the third cut or "decanted oil" comprised mainly of hydrocarbons of ASTM distillation point higher than about 300+ C, each of the three cuts also containing oxygen compounds, the process being so characterized that the said light fraction is subjected to fractionation during which, on the one hand, a fraction is discharged, which fraction comprises hydrocarbons with 5 or more carbon atoms per molecule and contains oxygen compounds, and, on the other hand, a fraction is collected, this fraction being fed to a polymerization zone in admixture with a fraction to be herinafter defined, the effluent from the polymerization zone being then fed to a fractionation zone to collect (a) a fraction containing relatively light olefins and paraffins, (b) fraction containing gasoline and (c) a fraction containing kerosene and gas oil to be treated as hereinafter indicated, wherein the fraction containing relatively light olefins and paraffins is at least partly subjected to an alkylation reaction, the effluent from the alkylation zone being subjected to fractionation from which there is obtained (a) at least one light hydrocarbon cut containing isoparaffins, (b) an alkylate utilizable as motor fuel and (c) a residue, at least a portion of the isoparaffins recovered from said fractionation being recycled to the alkylation zone, the process being further characterized in that said "light oil" and "decanted oil" cuts and the said fraction containing hydrocarbons with 5 or more carbon atoms per molecule and oxygen compounds from the fractionation of the "light fraction" are together subjected to a cracking-decarboxylation treatment,

after which treatment, the products from this cracking-decarboxylation treatment are subjected to fractionation, to obtain in addition to undensable gas and a residue, (a) one or more cuts containing olefins with 3 and 4 carbon atoms per molecule and relatively light saturated hydrocarbons, this cut being fed to said polymerization zone to be treated as herinbefore indicated, (b) a heavy gasoline cut and (c) a cut with an ASTM distillation point higher than about 200° C, which cut is admixed with said fraction containing kerosene and gas oil resulting from the fractionation of the products obtained in said polymerization zone and subjected to hydrotreatment, the effluent from this hydrotreatment being subjected to fractionation to obtain a gas cut, a kerosene cut, a gas oil cut and column bottoms, said column bottoms being at least partly recycled to said cracking-decarboxylation zone, in which process said fraction (b) containing gasoline recovered from the fractionation zone following the polymerization zone is admixed with said heavy gasoline cut (b) recovered from the fractionation following the cracking-decarboxylation treatment, and at least a portion of the mixture being thereafter treated in a hydrotreatment zone and then the effluent from said hydrotreatment zone being subjected to fractionation from which gasoline of high purity is recovered.

4,133,842
PRODUCTION AND RECOVERY OF LINEAR MONO-OLEFINS

Mark C. Anderson, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 25, 1977, Ser. No. 844,676
Int. Cl.² C07C 5/32
U.S. Cl. 260—683.3 **10 Claims**



1. In a process for dehydrogenating a hydrocarbon charge stock, consisting essentially of normal paraffins having from about 3 to about 20 carbon atoms per molecule to form linear mono-olefins the sequential steps of:

(a) reacting said charge stock in the presence of hydrogen, in a dehydrogenation reaction zone, at dehydrogenation conditions selected to convert paraffinic hydrocarbons to linear mono-olefinic hydrocarbons;

(b) separating the resulting dehydrogenation zone effluent, in a first separation zone, at separating conditions to provide (1) a hydrogen-rich, principally vaporous phase containing olefinic hydrocarbons and, (2) a second phase containing linear mono-olefinic hydrocarbons and unreacted normal paraffins;

(c) separating said second phase, in a second separation zone to (1) recover said linear mono-olefinic hydrocarbons, and (2) provide a normal paraffin concentrate containing olefinic hydrocarbons;

(d) reacting at least a portion of said hydrogen-rich vaporous phase, in a hydrotreating zone, at hydrotreating conditions selected to saturate the olefinic hydrocarbons therein; and,

(e) introducing the resulting substantially olefin-free effluent from said hydrotreating reaction zone into said dehydrogenation reaction zone.

4,133,843
POWDER COATING RESIN PROCESS

Robert A. Isaksen, Chardon, Ohio; Frederic J. Locke, East Longmeadow, Mass.; John L. Smith, Springfield, Mass., and George T. Spitz, Longmeadow, Mass., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 511,957, Oct. 4, 1974, Pat. No. 3,980,732, and a continuation-in-part of Ser. No. 318,292, Dec. 26, 1972, abandoned. This application Aug. 18, 1976, Ser. No. 715,486
Int. Cl.² C08L 61/32, 61/24, 67/02
U.S. Cl. 260—850 **6 Claims**

1. A process for preparing a curable powder resin composition with a sintering temperature above 40° C. and curable in the temperature range of 120° to 220° C., comprising:

(A) Condensing a methylolamino compound with an aliphatic alcohol and an aromatic sulfonamide of number average molecular weight less than 500 to produce an aminoplast condensate with a glass transition temperature in the range of −10° C. to 100° C., wherein the methylolamino compound is selected from the group consisting of methylolureas and methylolaminotriazines and contains no more than one unmethylolated N—H bond per molecule, wherein the aliphatic alcohol contains from 1 to 4 carbon atoms, wherein at least about 50 percent of the methylol groups of the methylolamino compound have been condensed with the aliphatic alcohol or the aromatic sulfonamide, wherein the molar ratio of the aliphatic alcohol to the methylolamino compound is at least 2, and wherein the molar ratio of the methylolamino compound to the aromatic sulfonamide is from about 1:0.5 to about 1:2 when the aromatic sulfonamide contains one reactive group per molecule and is from about 1:0.5 to about 1:1.5 when the aromatic sulfonamide contains 2 or more reactive groups per molecule,

(B) Blending from about 15 to about 30 parts by weight of the aminoplast condensate with from about 85 to 70 parts by weight of a polyester resin or an acrylic resin, wherein the resin has a glass transition temperature in the range of from 60° to 100° C. and a number average molecular weight in the range of 500 to 25,000 and contains alcoholic hydroxyl groups, carboxyl groups or amide groups heat reactive with the aminoplast condensate, wherein the polyester resin has an acid number in the range of 1 to 25 or a hydroxyl number in the range of 11 to 200, and wherein the acrylic resin contains from 0.13 to 18 weight percent of hydroxyl, carboxyl or amide groups, and

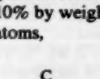
(C) Crushing the blend to form a powder of average particle size in the range of 20 to 150 microns.

4,133,844
PRODUCT AND PROCESS

Jack D. Taylor, Hendersonville, Tenn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 22, 1977, Ser. No. 818,085
Int. Cl.² C08L 77/00
U.S. Cl. 260—857 L **17 Claims**

1. An acid and disperse dyeable polyolefin composition consisting essentially of, based on the total weight of the composition, from about 80–98% by weight of a polyolefin; from about 1–10% by weight of an N-vinyl-2-pyrrolidone polymer having a moisture regain, measured at 37.8° C. and 98% relative humidity, of at least 10% and a ratio of mole fraction of N-vinyl-2-pyrrolidone units in the polymer to moles of water regained per 100 g of polymer of from greater than 0:1 to about 0.3:1; and from about 1–10% by weight of a polyamide having tertiary amine nitrogen atoms,



where all three carbon atoms are saturated, said polyamide

being normally a solid at 22° C., melting at a temperature of 235° C. or below, and having a structure member, N, of from 10–18, at least 25 mole % of all units in the polyamide having a basic tertiary amine nitrogen atom.

4,133,845

POLYSEGMENT COPOLYMERS

Manfred Beck, Odenthal; Günter Marwede, and Rainer Fritz, both of Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 636,933, Dec. 2, 1975, abandoned. This application Dec. 22, 1977, Ser. No. 863,083

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1974, 2457388

Int. Cl.² C08F *297/04*

U.S. Cl. 260—880 B **6 Claims**

1. Polysegment copolymers consisting of coupled diblock copolymers produced by coupling deactivated diblock copolymers of styrene and a conjugated diene of the idealized form S_x-B_y, wherein the styrene block S has 10 to 5,000 structural units x and the diene block B has 190 to 19,000 structural units y, with 0.5–20 mMole of sulphur chlorides per 100 grams of diblock copolymer.

4,133,846

HYDROXYL CONTAINING PHOSPHATES AND POLYPHOSPHATES

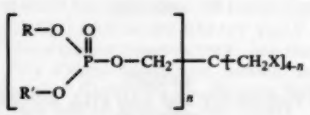
James A. Albright, Ann Arbor, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Jun. 30, 1977, Ser. No. 811,491

Int. Cl.² C07F *9/11*

U.S. Cl. 260—928 **7 Claims**

1. A phosphate of the formula



wherein R and R′ are independently selected from lower haloalkyls having 2 to 6 carbon atoms and 1 to 6 halogen atoms, n is an integer from 1 to 3, and wherein each X is independently selected from hydrogen, halogen, alkyl, and hydroxyl, provided that at least one X is hydroxyl.

4,133,847

VAPORIZED FUEL FOR INTERNAL COMBUSTION ENGINE AND METHOD AND APPARATUS FOR PRODUCING SAME

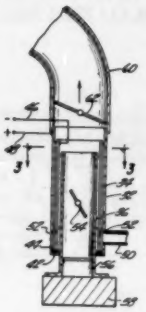
Arnold I. Feuerman, 5179 Corners Dr., West Bloomfield, Mich. 48033

Division of Ser. No. 553,566, Feb. 27, 1975, Pat. No. 4,011,843. This application Sep. 24, 1976, Ser. No. 726,178

Int. Cl.² F02B *51/04*

U.S. Cl. 261—18 A **1 Claim**

1. A vaporizer-carburetor for use with an electrolytic water-hydrocarbon emulsion comprising: a pair of tubes supported concentrically, the tubes having such dimensions as to define a volume between their adjacent walls; means for filling at least a portion of such volume with an electrolytic water-hydrocarbon emulsion; means for applying a potential difference between the tubes so as to cause current to pass through the emulsion to vaporize the fluid; and means for passing air



through the center tube to draw vapor from the space between the tubes and mix it with the air.

4,133,848

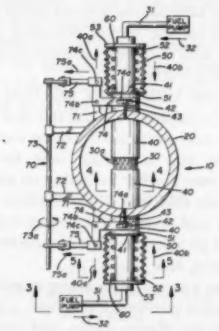
CARBURETION DEVICE

David L. Black, Box 1339, MacDill Air Force Base, Tampa, Fla. 33608

Filed Apr. 25, 1977, Ser. No. 790,342

Int. Cl.² F02M *7/14*

U.S. Cl. 261—41 B **2 Claims**



1. An improved carburetion device for use with an engine having a carburetor, a fuel pump for supplying fuel under high pressure and an accelerator, comprising;

(A) a main fuel line

(1) connecting to the fuel pump,

(2) having a plurality of perforations in its periphery, and

(3) passing through the air filled mixing chamber of the carburetor

(a) whereby the fuel is forced through said perforations, atomized and mixed with the air;

(B) a pair of cylindrical sleeves telescoped over said main fuel line and slidable therealong;

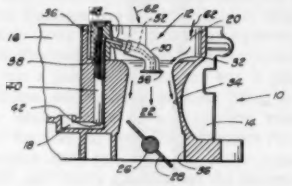
(C) means attached to said sleeves for moving them toward and away from each other; and

(D) said last mentioned means including springs secured to said sleeves and surrounding said main fuel line for normally urging said sleeves toward each other.

4,133,849
CARBURETOR ATOMIZER

Victor Hecht, 969 Alexander Dr., Haysville, Kans. 67060

Filed Nov. 11, 1974, Ser. No. 522,502
Int. Cl.[2] F02M 7/02
U.S. Cl. 261—78 R 1 Claim



1. A carburetor for supplying an air-fuel mixture, comprising:

(a) a body having fuel-air mixture conduit therethrough,

(b) said mixture conduit having an inlet on one end portion of said body an outlet on another end of said body, and a venturi portion between said inlet and said outlet, said carburetor being constructed and adapted to in use have air moving through said mixture conduit from said inlet through said venturi portion to said outlet,

(c) a fuel reservoir within said body,

(d) a throttle valve means in said mixture conduit selectively movable between a substantially closed position and a substantially fully open position to in use control fuel-air mixture flow through said mixture conduit,

(e) a fuel atomizing means mounted within said body and having an atomizer tube extending into a center portion of said mixture conduit with the outlet of said atomizer tube in said center portion of said conduit,

(f) said atomizer tube having a flared outlet end portion with the outlet end surface thereof extending transverse to said conduit, and with said outlet thereof opening toward said mixture conduit outlet,

(g) a base secured to said body, said base including a feed tube vertically disposed therein, one end of said feed tube connected to said reservoir, the other end of said feed tube connected to said atomizing tube for supplying fuel thereto, said base further including an idle tube vertically disposed inside said feed tube, one end of said idle tube connected to said reservoir, the other end of said idle tube connected to an idle circuit in said carburetor for supplying fuel thereto, and

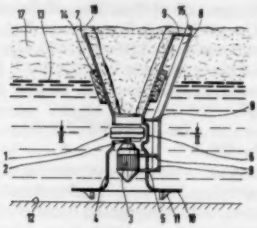
(h) said base has a structure defining a cavity situated in the very most upper portion of said base, a plug is positioned on the upper end of said cavity, said atomizer tube flared outlet end portion is positioned in the low pressure zone of said venturi portion, said throttle means is downstream of said venturi portion, said atomizer tube has a substantially smooth interior to in use provide a substantially streamline flow, said atomizer tube extends into said conduit angularly toward said conduit outlet, said outlet end surface is substantially flat and essentially circular, said atomizer tube outlet has an outlet orifice centrally disposed relative to said outlet end surface, said carburetor has one inlet dividing into a plurality mixture conduits each having an outlet, and said carburetor has one of said fuel atomizing means in each of said plurality of mixture conduits,

said carburetor is constructed and adapted to in use mix air and fuel in said mixture conduit with the atomizer tube flared outlet end portion creating a turbulance in the air flow in said mixture conduit to draw fuel through said atomizer tube and over said transverse outlet end surface for complete atomization of the fuel.

4,133,850
APPARATUS IN A TANK FOR AERATING LIQUIDS WHICH TEND TO FROTH

Hans U. Hauser, Niederweningen, Switzerland, assignor to Bucher-Guyer AG, Maschinenfabrik, Niederweningen, Switzerland

Filed Dec. 20, 1976, Ser. No. 752,148
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1975, 2557200
Int. Cl.[2] B01F 3/04
U.S. Cl. 261—93 14 Claims



1. In a tank having a bottom containing a liquid with a varying surface level, an apparatus for aerating said liquid which tends to froth and for controlling the froth thickness in said tank, said apparatus comprising:

rotating blade means, immersed in said liquid, for mixing air and said liquid forming a froth, said rotating blade means including an outlet;

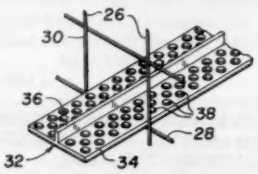
funnel-shaped air supply means for conducting air to said blade means, said air supply means coaxially located above said rotating blade means and having a buoyancy means for automatically maintaining an inlet to said air supply means a predetermined distance above said varying surface level, said distance corresponding to a desired froth thickness said funnel-shaped air supply means further having a wide portion of said funnel-shape defining said inlet; and

liquid supply means for conducting said liquid to said blade means.

4,133,851
COOLING TOWER SPLASH BAR FILL ASSEMBLY AND METHOD

John C. Ovard, Santa Rosa, Calif., assignor to Ecodyne Corporation, Santa Rosa, Calif.

Filed May 11, 1977, Ser. No. 795,691
Int. Cl.[2] B01F 3/04
U.S. Cl. 261—111 12 Claims



1. A splash bar fill assembly for a crossflow cooling tower comprising:

a plurality of splash bars, each splash bar comprising a longitudinally extending relatively thin substantially planar perforate horizontal section, a relatively thin vertically disposed rib section connected longitudinally to said horizontal section along an upper longitudinal face thereof, the height of said rib section being greater than the thickness of said horizontal section, means along the top of said rib section for laterally diverting falling liquid impinging

upon said rib section onto said horizontal section, means appended to the upper face of said splash bar for guiding liquid laterally of said horizontal section to inhibit liquid accumulation upon said upper face, said horizontal section being adapted to intercept and fragment falling liquids; and

means for supporting said splash bars in horizontal alignment and axially parallel to normal air flow, said splash bars being disposed in a vertically and laterally alternating rib pattern for fragmenting and cooling falling liquid and for dispersing falling liquid laterally of said air flow.

12. A method of cooling a liquid in a crossflow cooling tower wherein said cooling tower includes a fill assembly with a plurality of longitudinally extended splash bars having a horizontal section with perforations and a rib section adjoining the upper face of said horizontal section, the height of said rib section being greater than the thickness of said horizontal section, said splash bars being disposed in cross section in a horizontal and vertical grid pattern, said method comprising the steps of:

flowing air through said fill assembly longitudinally parallel to said splash bars;

splashing warm liquid through said fill assembly transverse of said air flow;

directing a first portion of said liquid downwardly to impinge upon said rib section of said splash bars to fragment and to laterally disperse said first portion onto said horizontal section of said splash bars;

directing a second portion of said liquid downwardly to impinge upon said horizontal section;

directing a third portion of said liquid downwardly to pass through said perforations and to impinge upon a lower splash bar for fragmenting said third portion;

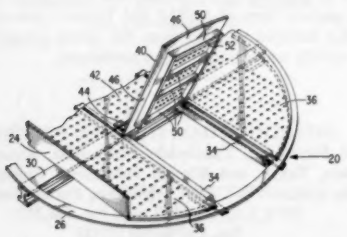
deflecting said first, second and third portions laterally of said splash bars for dispersing said liquid laterally of air flow through said fill assembly; and

repeating said flowing, splashing, directing, and deflecting steps through said fill assembly to fragment said liquid into uniformly dispersed droplets for creating maximum heat exchange surface between said liquid and air.

4,133,852
HINGED PRESSURE RELIEF TRAY

Arthur R. DiNicolantonio, Madison, N.J., and Humphrey R. Theysen, Cura Cabay, Netherlands Antilles, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Sep. 13, 1976, Ser. No. 722,871
Int. Cl.[2] B01F *3/04*
U.S. Cl. 261—114 TC **13 Claims**

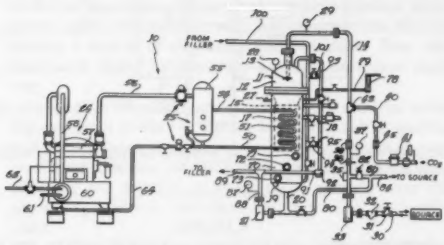


1. A fractionation tray for a tower for contacting liquid with a vapor and characterized by pressure surges therein during operation, said tray comprising fixed and movable chordal sections disposed in a planar surface during normal operation of said tower, including at least a movable tray section which has a normally closed position, means for supporting said tray in said tower in a substantially horizontal position, said movable tray section being hinged at an end thereof for pivotal upward movement away from said support means in response only to pressure surges of at least a predetermined level in said tower and returning to said normally closed position after said pressure surge has subsided.

4,133,853
AEROSOL CARBONATOR

William C. Ore, Elmhurst, and Sigmund P. Skoli, Elmwood Park, both of Ill., assignors to Mojonnier Bros. Co., Chicago, Ill.

Filed Aug. 26, 1977, Ser. No. 827,897
Int. Cl.[2] B01F *3/04*
U.S. Cl. 261—140 R **20 Claims**



1. An aerosol carbonator for charging a liquid with a carbon dioxide propellant, comprising, in combination, a saturator vessel, liquid inlet means in the vessel for dispensing liquid within the vessel, at least one cooling member within the vessel for cooling the dispensed liquid, gas inlet means for injecting carbon dioxide gas into the vessel for absorptive contact with the liquid, vessel outlet means, transfer line means connected to the outlet for transferring liquid from the outlet to a remote source of variable fluid demand, and recirculating means connected between the saturator vessel outlet means and the saturator vessel itself for returning to the saturator vessel fluid amounts in excess of those fluid amounts required to be fed into the transfer means to satisfy the source of variable fluid demand.

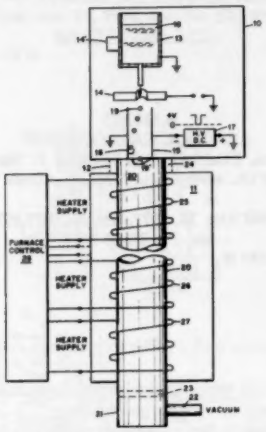
4,133,854
METHOD FOR PRODUCING SMALL HOLLOW SPHERES

Charles D. Hendricks, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 16, 1977, Ser. No. 807,108
Int. Cl.[2] B01J *2/02*
U.S. Cl. 264—10 **5 Claims**

1. A method for producing small hollow spheres of uniform wall thickness and diameter comprising the steps of: forming drops from a solution of selected materials composed of sphere forming material and a blowing agent which decomposes at a certain temperature producing a gas agent, placing an electrical charge on at least a portion of the thus formed drops, passing the thus formed drops along a flow path through deflection electrode means wherein the drops having a certain electric charge are deflected from the flow path and separated from the remaining drops, passing the remaining drops through a multiple zone oven having an increasing temperature in each subsequent zone causing drying of the drops and forming same into hollow spheres by melting of the thus dried

drops and thermal decomposing of the blowing agent such that a bubble is formed therein and expanded to form the sphere



forming material into hollow spheres of substantially uniform wall thickness upon cooling.

4,133,855

PROCESS FOR PRODUCING SHAPED PARTS FROM SYNTHETIC AND DEVICE FOR ACCOMPLISHING THE PROCESS

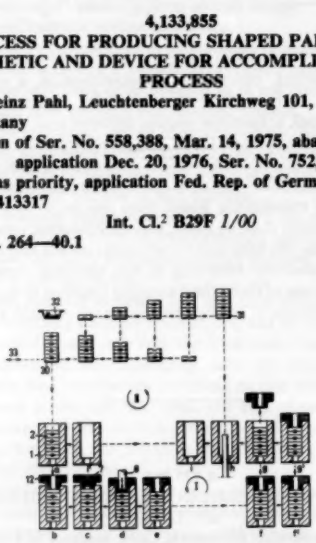
Karl-Heinz Pahl, Leuchtenberger Kirchweg 101, 4 Dusseldorf, Germany

Division of Ser. No. 558,388, Mar. 14, 1975, abandoned. This application Dec. 20, 1976, Ser. No. 752,714

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1974, 2413317

Int. Cl.[2] B29F *1/00*

U.S. Cl. 264—40.1 **15 Claims**



1. A cyclic process for molding shaped parts from material by filling molds under pressure, hardening and removing molded articles from the molds wherein the molds comprise movable, essentially identical form carriers, and mold inserts and at a first station the form carriers are provided with article-related mold inserts preselected for the work cycle and the mold inserts are locked in the carriers under closing pressure, the form carriers provided with mold inserts are conveyed to a second station wherein the molds are filled with the material, the molds filled with the material are conveyed to a third station wherein the material is exposed to molding temperatures and pressure conditions for formation of the shaped parts, the form carriers containing the shaped parts are conveyed to a fourth station wherein the mold inserts are removed from the form carriers, and the form carriers are thereafter conveyed to said first station wherein the form carriers are again outfitted with mold inserts the molds being provided with adjustable coding which is a function of values important for the production cycle, and reading the coding, and controlling the production cycle with a computer associated with the reading of the coding.

4,133,856

PROCESS FOR PRODUCING A POSITIVE ELECTRODE FOR A NON-AQUEOUS CELL

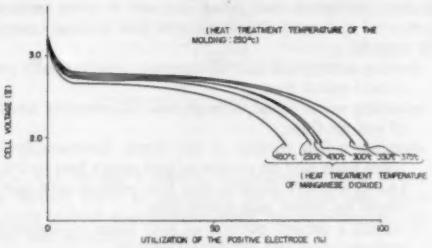
Hironosuke Ikeda, Hirakata; Mitsunori Hara, and Satoshi Narukawa, both of Kobe, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Aug. 31, 1977, Ser. No. 829,494

Claims priority, application Japan, Sep. 29, 1976, 51/118327

Int. Cl.[2] C04B *35/52*

U.S. Cl. 264—63 **6 Claims**



1. A process for producing a positive electrode for a non-aqueous cell comprising heat-treating manganese dioxide at a temperature within the range of 350–430° C.; combining the treated manganese dioxide with a conductive agent and a binder; molding the resultant mixture; and heat-treating the resultant molding at a temperature within the range of 200–350° C. to form said electrode.

4,133,857

METHOD FOR PRODUCING A GRANULAR SORBIC ACID

Masaaki Takano, and Masahiro Nakajima, both of Minamata-shi, Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Jun. 3, 1976, Ser. No. 692,626

Claims priority, application Japan, Sep. 16, 1975, 50-111892; Oct. 16, 1975, 50-124677; Apr. 9, 1976, 51-40051

Int. Cl.[2] B01J *2/20*

U.S. Cl. 264—120 **11 Claims**

1. A method for producing a granular sorbic acid which consists of granulating by extrusion a powder of sorbic acid having particle sizes of ASTM No. 70 sieve pass in the presence of a material selected from the group consisting of (a) water and (b) water containing a surfactant.

4,133,858

INJECTION FOAM MOLDING PROCESS

Akifumi Hayakawa, Yokohama; Akira Aiba, Kawasaki; Eiki Orihara, Tokyo, and Kiyoshi Fukushima, Fujisawa, all of Japan, assignors to USM Corporation, Farmington, Conn.

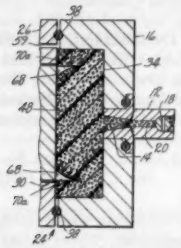
Filed Dec. 14, 1977, Ser. No. 860,317

Int. Cl.[2] B29D *27/00*

U.S. Cl. 264—54 **3 Claims**

1. In an injection foam molding process including the steps of forming a molten mixture of heat fusible synthetic polymeric resin and a compound chemically decomposable by heat to form gas as blowing agent, injecting said mixture into the cavity of a mold under conditions that the mold cavity is filled with the mixture at foaming temperature, said mold having a first section which protrudes into the mold cavity at the time of injection and which has a surface portion and side edges, said side edges having portions initially exposed within the mold cavity and which are in sliding engagement with side edges of

another mold section to form a tight joint, said first mold section being movable to bring said surface portion into registry with a mold surface portion of said other mold section to increase the volume of the mold cavity, moving said first mold section to increase the volume of the mold cavity to permit the mixture to foam and solidifying the mixture, the improvement which comprises sealing the mold, supplying gas to the mold cavity to develop a gas pressure of at least about 10 Kg/cm^2 to resist foaming of the molten mixture injected into the mold, injecting the molten mixture into the mold under conditions which fill the mold cavity with the mixture in substantially unfoamed condition, discharging gas from said cavity during said injection at a rate to avoid burning of said resin by gas compression temperature increase but not to lower the pressure below said foam resisting pressure, reducing the gas pressure substantially to atmospheric pressure substantially immediately when said mold cavity is filled and thereafter moving said first mold section to increase the volume of the mold cavity during the time interval in which A. thickened resin on marginal portions of the protruding mold surface portion adjacent the joint between the mold sections remains soft, deformable and extensible by the expansion force of the blowing agent, and B. the expansion force of said blowing agent has reached a value to force said resin against the moving wall and to extend portions of thickened resin on said marginal portions of said movable mold surface adjacent said joint between mold sections into close proximity to resin cooled on said side edges to form a narrow crease line.



4,133,859

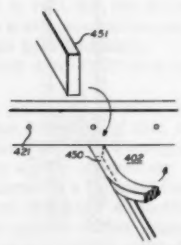
PROCESS AND APPARATUS FOR MAKING A PLURALITY OF BUILDING MODULES

Matthew R. Piazza, Nichols, Conn., assignor to Maso-Therm Corporation, Bridgeport, Conn.

Filed Jun. 27, 1977, Ser. No. 810,449

Int. Cl.[2] B28B *1/08*

U.S. Cl. 264—71 **11 Claims**



1. Process for making a plurality of building modules each having an insulating foam core encased in a shell of fiber reinforced cementitious material which comprises:

(a) providing a longitudinal casting zone having continuous side rails and end-to-end base members having lengths corresponding to the lengths of the modules being formed;

(b) casting a continuous bottom layer over the base members and extending the length of the casting zone, said layer comprising wet cementitious material having a matrix of randomly interconnected fiber reinforcement which is cast by successively applying wet cementitious material and chopped fiber to the length of the casting zone base;

(c) dividing said bottom layer into lengths corresponding to the lengths of the modules being formed and inserting lateral end members between the side rails in the spaces between the divided bottom layer lengths;

(d) placing foam core members on each of the bottom layer lengths, said foam core members having a peripheral shape smaller than the surface of the bottom lengths so as to leave a free space between the core member, the side rails and the end members, said core member having a height less than the height of the side rails;

(e) successively applying wet cementitious material and chopped fiber to the entire length of the casting zone so as to fill the free space surrounding each core member and to cover each core member with wet cementitious material having a matrix of randomly interconnected fiber reinforcement thereby completely encasing each core member;

(f) allowing the fiber reinforced cementitious material encasing each core to cure to a point where it is self supporting and withdrawing the individual modules each supported on a base member longitudinally from the casting zone, allowing the support modules to completely cure and separating said base members for recycle to the casting zone.

9. Process for making a plurality of composite cementitious panel members each reinforced with a randomly interconnected fiber matrix which comprises:

(a) providing a longitudinal casting zone having continuous side rails and end-to-end base members having lengths corresponding to the lengths of the panels being formed;

(b) casting a continuous layer over the base members and extending the entire length of the casting zone, said continuous layer comprising wet cementitious material having a matrix of randomly interconnected fiber reinforcement which is cast by successively applying wet cementitious material and chopped fiber to the length of the casting zone base;

(c) dividing the continuous layer into discrete unconnected lengths of panels by inserting lateral members between the side rails, before casting the bottom layer in step, laterally at the juncture between said end-to-end base members and removing the lateral members, after casting together with the overlying portion of the layer formed in step (b);

(d) withdrawing the individual panels from the casting zone each supported on their associated base members.

4,133,860

METHOD OF MOULDING A REINFORCED THERMOPLASTIC ARTICLE

Herbert J. Sharp, Greenford, England, assignor to United States Steel Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 540,761, Jan. 14, 1975, abandoned. This application Nov. 8, 1976, Ser. No. 739,775

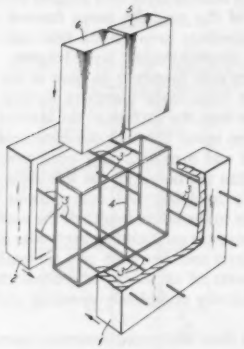
Claims priority, application United Kingdom, Jan. 14, 1974, 1742/74

Int. Cl.[2] B29C *17/07*; B29D *3/02*

U.S. Cl. 264—528 **4 Claims**

1. A method of producing an article comprising a hollow three dimensional array of elongate reinforcement elements encapsulated in a thermoplastic material, the method comprising a blow moulding process which includes the steps of locating said three dimensional array of elongate reinforcement elements within a mould in a position to provide reinforcement of said article and spaced apart from the surface of said mould a distance sufficient to allow encapsulation of said elongate elements of said array by said thermoplastic material, said array being supported vertically and horizontally in a fixed position in relation to said mould during encapsulation by a

plurality of retractable supports; providing at least one hollow soft parison of thermoplastic material inside said three dimensional array, providing an increase in pressure inside said parison to expand said parison into conformity with said mould surface while substantially encapsulating said reinforcement



elements with said thermoplastic material, and, while the expanding and encapsulating step proceeds, gradually retracting said supports to a withdrawn position so that said thermoplastic material fills the cavities left by said retractable supports, and supports said array, and allowing said thermoplastic material to cool and set.

4,133,861

PROCESS FOR CONTINUOUS MANUFACTURE OF METHYL METHACRYLATE POLYMER PLATE

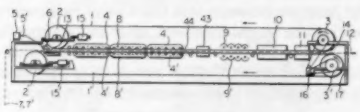
Tetsuji Kato, Otake, Japan, assignor to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 434,349, Jan. 17, 1974, abandoned. This application Oct. 7, 1976, Ser. No. 730,363

Claims priority, application Japan, Jan. 18, 1973, 48-8166; Jan. 18, 1973, 48-8160

Int. Cl.[2] B29D *7/14, 7/22*

U.S. Cl. 264—216 **1 Claim**



1. A process for continuously manufacturing a methyl methacrylate polymer plate, wherein a polymerizable mixture of monomer-polymer methyl methacrylate is held between continuously traveling upper and lower horizontal flat belts having side sealing gaskets held between and traveling with the belts adjacent to but at least slightly inwardly offset from the belts' side edges so as to form outwardly facing channels, passing said belts and gaskets through a first polymerization zone forming said mixture into a plate and wherein the belts and gaskets are contacted by water having a temperature of from 60° C to 100° C and so that the belts and gaskets leave this first zone with residue water clinging to their flat surfaces and in said channels, first removing said residue water from the flat surfaces of said belts by holding back the residue water thereon so as to consequently force the residue water on the upper belt's flat surface to flow transversely therefrom and drip down its side edges and subsequently removing the residue water from said channels so that all outer surfaces of said belts and gaskets are free from said residue water in excess of a film of evaporating water, and after evaporation of said film passing the belts and gaskets through a second polymerization zone heating the plate to a temperature of from 120° C to 160° C, said first removing of residual water being done by pressing rotative sponge rollers transversely on the belts' said flat surfaces so as to absorb the residue water therefrom and by rotation of the rollers return the water to the surfaces with squeezing of the rollers to squeeze out the absorbed water and said subsequent removal of the residue water from said channels being done by blowing air into said channels with the air directed in a direction opposite to the movement of said traveling belts, said polymer plate after leaving said second polymerizing zone being cooled to a temperature less than 90° C at a rate of at least about 0.5° C per minute and at a rate not more than 20° C per minute while cooling through that portion of the temperature range of about 120° to about 105° C and thereafter being withdrawn from said belts.

4,133,862

METHOD OF INHIBITING AND/OR ERADICATING MARINE FUNGAL GROWTH WITH OBTUSASTYRENE

John D. Bultman, Oxon Hill, Md.; Donald D. Ritchie, New York, N.Y., and Leonard Jurd, Berkeley, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 6, 1977, Ser. No. 804,193

Int. Cl.[2] A61L *13/00*

U.S. Cl. 422—28 **4 Claims**

1. A method of rendering wood resistant to marine fungical growth which comprises impregnating said wood with obtusastyrene.

2. A method of treating wood for eradicating marine fungical growth thereon which comprises contacting said wood with obtusastyrene.

4,133,863

COLLECTION TUBE ASSEMBLY AND METHOD FOR COLLECTING BIOLOGICAL FLUIDS

Elmer A. Koenig, Arlington Heights, Ill., assignor to Sherwood Medical Industries, Inc., St. Louis, Mo.

Filed Mar. 23, 1977, Ser. No. 780,282

Int. Cl.[2] A61M *5/00;* **B01L** *3/00*

U.S. Cl. 422—99 **2 Claims**

1. A biological fluid sample collection tube assembly comprising:

a fluid sample receiving container having opposite ends and an interior wall defining a fluid-receiving chamber;

closure means closing one end of said container; said closure means including a cannula-puncturable member adapted to be pierced by a cannula needle for delivery of a biologi-

cal fluid sample into the fluid-receiving chamber of said container;

the other end of said container being open;

a vacuum-creating member disposed within the container and spaced from said open end thereof; said vacuum-creating member having a peripheral portion in fluid sealing engagement with the interior wall of said container so that when said vacuum-creating member is moved toward said open end of said container at least a partial vacuum will be created between said cannula-puncturable member and said vacuum-creating member; said vacuum creating member including outer end portions which are rounded and which fit outside said open end of said container when said vacuum creating member is withdrawn into said open end of said container;

the space between said vacuum-creating member and said closure means being at substantially atmospheric pressure before said vacuum-creating member is moved toward said open end of said container; and

means normally separated from said vacuum-creating member and adapted to be selectively placed in operative association with said vacuum-creating member for moving said vacuum-creating member toward said open end of said container to create at least a partial vacuum therein.

4,133,864

PROCESS FOR PREPARING TITANIUM DIOXIDE

Kosaki Yoshio, Kita; Yagi Katsumi, Hikashi, and Kura Yasuo, Osaka, all of Japan, assignors to Dong Hwa Titanium Industrial Co., Seoul, Rep. of Korea

Filed Mar. 23, 1978, Ser. No. 889,405

Claims priority, application Rep. of Korea, Mar. 29, 1977, 77-761

Int. Cl.[2] C01G *23/06*

U.S. Cl. 423—85 **3 Claims**

1. A process for preparing titanium dioxide of controlled particle size which comprises:

heating an aqueous sulfuric acid solution containing not more than 200 grams of TiO_2 per liter of solution until the degree of hydrolysis is about 10 and 20% and forms precipitate filterable particles thereof;

filtering said solution to remove said particles of TiO_2 and give an almost clear filtrate;

further hydrolyzing said filtrate and slowly adding 6–8 parts by volume of said original aqueous acid solution of TiO_2 per 1 part of filtrate; and

recovering a hydrolyzed precipitate which can be calcined to give TiO_2 having a color index of 1500 or greater.

4,133,865

PROCESS FOR PREPARING METALLIC SULPHATES

John H. Calbeck, Pratt, Kans., assignor to W. J. Trust; J. R. Calbeck, trustees, Pratt, Kan.

Filed Jul. 5, 1973, Ser. No. 376,449

The portion of the term of this patent subsequent to Sep. 9, 1992, has been disclaimed.

Int. Cl.[2] C01G *9/06, 3/10*; C01C *1/26*; C01B *17/64*

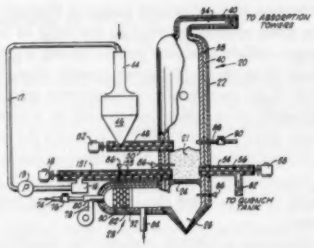
U.S. Cl. 423—106 **18 Claims**

1. In a process for producing metallic sulfates of metals selected from the group consisting of zinc, copper, iron and cadmium, which process comprises forming a mixture of the corresponding metallic sulfide concentrates and ammonium sulfate, heating said mixture in a non-oxidizing atmosphere of temperatures of between about 150° C. to 480° C. to convert said mixture into said metallic sulfate, ammonia, sulfur and sulfur dioxide, removing said metallic sulfate from the heating zone and quenching said metallic sulfate in water, passing the volatile products of the reaction consisting essentially of ammonia, sulfur vapor, sulfur dioxide and water into a first absorption zone at temperatures of between about 100° C. and 150° C. to form ammonium thiosulfate, passing the residual gases from said first zone into a second zone where the residual ammonia is absorbed in water, the improvement comprising, converting at least about 95% wt. of said sulfide to said sulfate by

(a) adding to said mixture of ammonium sulfate and metallic sulfide, a quantity of the corresponding metallic sulfate to inhibit the development of agglomerating conditions in the reaction of said metallic sulfide concentrates with said ammonium sulfate and to form a resulting feed mixture consisting of about 25–75% wt. of said metallic sulfide, 23–73% wt. of said ammonium sulfate, and 2–14% wt. of said metallic sulfate;

(b) introducing said resulting feed mixture into the upper portion of a fluidized bed reactor;

(c) directly heating said resulting feed mixture to a temperature of about 150–480° C. with the products of combustion of a heating fuel selected from the group consisting of water gas, producer gas, natural gas, and mixtures thereof, said products of combustion comprising between about 1.0% by volume to about 6.0% by volume of reducing gases selected from the group consisting of hydrogen,



carbon monoxide, and mixtures thereof, to convert said resultant feed mixture to metallic sulfate, ammonia, sulfur, sulfur dioxide and water, while maintaining evolved sulfur and sulfur dioxide in a molar ratio of about 1 to 1 and to maintain evolved ammonia and produced metallic sulfate in a molar ration of about 1 to 1;

(d) removing the metallic sulfate from the lower portion of said reactor and passing said removed metallic sulfate to a quench zone where the sulfate is dissolved in water to form a metallic sulfate solution;

(e) sweeping carbon dioxide, evolved sulfur, sulfur dioxide, and ammonia out of the upper portion of said reactor;

(f) passing the swept out gases into a first absorption zone where the sulfur dioxide and a portion of the ammonia are dissolved and reacted to form an ammonium thiosulfate solution; and

(g) passing the remaining gases from the first absorption zone to a second absorption zone where the remaining ammonia and the carbon dioxide are scrubbed with water and react to form an ammonium carbonate solution.

4,133,866

PROCESS FOR THE SELECTIVE SEPARATION OF THE BOUND SODIUM CONTENT OF RED MUD

Tamás Lakatos; Mihály Miskei; János Szolnoki, all of Budapest; Ferenc Tóth, and László Révész, both of Almásfuzito, all of Hungary, assignors to Aluminiumipari Tervezo es Kutato Intezet; Almasfuzitoi Timfoldgyar and MTA Geokemiai Kutatolaboratorium, all of Hungary

Filed Oct. 28, 1977, Ser. No. 846,588

Claims priority, application Hungary, Oct. 29, 1976, AU 364

Int. Cl.[2] C22B *26/10*

U.S. Cl. 423—208 **7 Claims**

1. A process for the selective recovery of the sodium content of red mud from alumina production according to the Bayer process, characterized in that said red mud or a slurry thereof is admixed with a ferric sulfate solution, the resulting suspension is stirred intensively for 0.5 to 1 hour at 15° to 85° C., and

thereafter solid substance is removed from the suspension at a pH of 4.4 to 4.6.

4,133,867
COUNTER-CURRENT PROCESS WITH A HYDRODESULFURIZATION OF SOLID CARBONACEOUS MATERIALS

Herbert E. Nuttall, Jr., Albuquerque, N. Mex., and Allan S. Sass, Los Angeles, Calif., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed Apr. 25, 1974, Ser. No. 463,854
Int. Cl.[2] C01B 17/00; C10B 57/00
U.S. Cl. 423—244 21 Claims

1. A process for the desulfurization of solid particulate sulfur bearing carbonaceous materials which comprises:

(a) passing the solid particulate sulfur bearing carbonaceous material in admixture with a carrier gas stream comprising hydrogen at an elevated pressure through a desulfurization zone counter-current to the flow of metal oxide hydrogen sulfide acceptor pellets having a particle size from about 50 to about 500 times greater than the particle size of the solid particulate carbonaceous material, said desulfurization zone being maintained at a temperature from about 1200° to about 1800° F wherein the sulfur contained in the solid particulate carbonaceous material reacts with hydrogen to form hydrogen sulfide which reacts with the metal oxide to form the corresponding metal sulfide and water;

(b) removing a stream comprising desulfurized carbonaceous material, water and carrier gas from one end of the desulfurization zone while removing pellets containing metal in the sulfide state from the opposed end of the desulfurization zone.

4,133,868
ISOCYANATES PROCESS III

Robert K. Jordan, Pittsburgh, Pa., assignor to Idram Engineering Company Est., Vaduz, Liechtenstein

Filed Aug. 16, 1977, Ser. No. 825,057
Int. Cl.[2] C01C 3/14; C07C 118/00
U.S. Cl. 423—365 4 Claims

2. A process for the production of isocyanic acid comprising combining a metal salt of carbamic acid and an acyl fluoride.

4,133,869
HYDROGEN PEROXIDE STABILIZATION

Leo Kim, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 31, 1977, Ser. No. 847,273
Int. Cl.[2] G01B 15/02
U.S. Cl. 423—272 4 Claims

1. A method of stabilizing an aqueous hydrogen peroxide solution against decomposition caused by transition metals, said solution having up to about thirty percent by weight of hydrogen peroxide, which comprises adding to the solution more than about 0.001 milliliters of acetonitrile per milliliter of total solution.

3. A composition comprising an aqueous hydrogen peroxide solution containing up to about thirty percent by weight of hydrogen peroxide and more than 0.001 milliliters of acetonitrile per milliliter of total solution.

4,133,870
PROCESS FOR PREPARING AMMONIUM SULFAMATE

Reinhold Gräser, Frankfurt am Main, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 8, 1978, Ser. No. 884,688
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1977, 2710399
Int. Cl.[2] C01B 21/54
U.S. Cl. 423—388 5 Claims

1. Process for preparing ammonium sulfamate by introducing sulfur trioxide and ammonia into a pressure vessel that contains a melt essentially consisting of ammonium sulfamate and ammonium imido disulfonate, which comprises maintaining a molar ratio of NH_3 to SO_3 of 1.5 to 1.99:1 maintaining an ammonia partial pressure of above 1 bar in the gas-filled space of the pressure vessel, and refraining from removing the gases that accumulate on top of the molten-liquid phase, from the pressure vessel.

4,133,871
PROCESS FOR PREPARING ALUMINA

William C. Ziegenhain; Ronald L. Poe; Larry L. Bendig, and John F. Scamehorn, all of Ponca City, Okla., assignors to Continental Oil Co., Ponca City, Okla.

Filed Aug. 1, 1977, Ser. No. 820,528
Int. Cl.[2] C01F 7/02
U.S. Cl. 423—628 8 Claims

1. In the method of preparing alumina by water hydrolysis of aluminum alkoxides in a reactor, and wherein the alkoxide groups contain from 2 to 40 carbon atoms, the improvement comprising admixing the water and aluminum alkoxide, wherein said aluminum alkoxide has a velocity of greater than 40 feet per second, prior to passing the resulting admixture to the reactor, said improved process being characterized further in that

(a) the resulting product has improved pore volume and bulk density properties and

(b) the velocity is defined by the formula

$$V = F/p\,A$$

wherein V = velocity in feet per second, F = rate of flow in pounds per second, p = density in pounds per cubic foot, and A = orifice area in square feet.

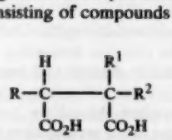
4,133,872
COMPOSITIONS FOR PREPARATION OF AQUEOUS SOLUTIONS OF SALTS OF LOWER VALENCE ^{99}TECHNETIUM

Manfred Schmidt-Dunker, and Wolfgang Greb, both of Düsseldorf, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Düsseldorf, Fed. Rep. of Germany

Filed Sep. 23, 1976, Ser. No. 725,772
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1975, 2543350
Int. Cl.[2] A61K 29/00, 43/00
U.S. Cl. 424—1 14 Claims

1. A composition for use in the preparation of aqueous solutions containing ^{99m}technetium for use in the detection by scintigraphy of bones and calcareous tumors, comprising:

(A) one or more water-soluble carboxyphosphonic compounds having three carboxylic acid groups selected from the group consisting of compounds of the formula:



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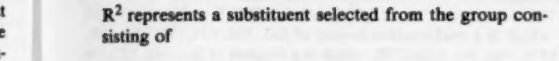
wherein R represents a substituent selected from the group consisting of H and C_{1-3} alkyl;

R^1 represents a substituent selected from the group consisting of $-PO_3H_2$, and

R^2 represents a substituent selected from the group consisting of



with the proviso that when R^1 is $-PO_3H_2$, R^2 is other than H or C_{1-3} alkyl; and the pharmaceutically-acceptable water-soluble salts of the above acids; and

(B) a pharmaceutically acceptable water-soluble salt selected from the group consisting of tin (II), iron (II) or chromium (II) salts in less than stoichiometric quantities based on component (A).

4,133,873

METHOD OF DETERMINING EXTRACELLULAR ANTIGENS AND ANTIBODIES

Hans G. Noller, 1512 Basswood Cir., Glenview, Ill. 60025

Filed May 24, 1976, Ser. No. 689,335

Claims priority, application Fed. Rep. of Germany, May 26, 1975, 2523209

Int. Cl.² G01N *21/52, 33/16*

U.S. Cl. 424—8 **9 Claims**

1. A method of determining the amount of a member of the group consisting of an extracellular antigen and an extracellular antibody capable of specifically combining with said antigen, which comprises:

(a) tagging said member with a fluorescent material;

(b) exposing the tagged member to a pulse of light of a first wavelength,

(1) the intensity and duration of said pulse being sufficient to cause the emission of secondary light by the tagged exposed member without causing significant decomposition of said material,

(2) said secondary light having a second wavelength different from said first wavelength;

(c) sensing said secondary light; and

(d) generating a perceptible signal in response to and commensurate with the sensed secondary light.

4,133,874

LIPID ENCAPSULATED HEMOGLOBIN CELLS

Irving F. Miller, Evanston, and Ljubomir Djordjevich, Chicago, both of Ill., assignors to The University of Illinois Foundation, Urbana, Ill.

Continuation-in-part of Ser. No. 694,903, Jun. 10, 1976. This application Feb. 10, 1978, Ser. No. 876,717

Int. Cl.² A61K *9/42, 9/50, 35/14, 35/18*

U.S. Cl. 424—38 **10 Claims**

1. A synthetic cell for use in oxygen and carbon dioxide transport as an in vivo substitute for naturally-ocurring erythrocytes, said cell comprising a synthetic cell membrane of lipid material having stromafree hemoglobin encapsulated therein.

8. A composition comprising the cell of claim 1 in combination with a liquid carrier physiologically compatible with a host animal to whom the composition is administered.

4,133,875

METHOD OF CONTROLLING DENTAL CARIES WITH STREPTOCOCCUS MUTANS MUTANT STRAINS

Jeffrey D. Hillman, Jamaica Plain, Mass., assignor to Forsyth Dental Infirmary for Children, Boston, Mass.

Filed Feb. 23, 1978, Ser. No. 880,499

Int. Cl.² A61K *37/00, 7/16*

U.S. Cl. 424—93 **11 Claims**

1. A method for controlling the incidence and severity of dental caries comprising injection into the oral cavity of a host susceptible to dental caries a dental-caries-controlling amount of a suitable innoculum of an effector strain for *Streptococcus mutans* BHT-2 (str).

4,133,876

ANTIBIOTIC A-32887 AND PROCESS FOR PRODUCTION THEREOF

Robert L. Hamill, Greenwood, and Marvin M. Hoehn, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed May 31, 1977, Ser. No. 801,876

Int. Cl.² A61K *35/00*

U.S. Cl. 424—121 **4 Claims**

1. A compound selected from the group consisting of (1) the acetyl ester derivative of antibiotic A-32887, having an approximate empirical formula of $C_{50-51}H_{82-88}O_{18-19}$, and which in its Na-K salt form has a molecular weight of about 988, a melting point of about 127°–129° C., and an approximate R_f value of 0.40 on silica-gel TLC in benzene:ethyl acetate (1:1), and an infrared absorption spectrum as shown in FIG. 4 of the drawings; (2) the n-butyryl ester derivative of antibiotic A-32887 having an approximate empirical formula of $C_{52-53}H_{86-92}O_{18-19}$, and which in its Na-K salt form has a molecular weight of about 1016, a melting point of about 59°–62° C., an approximate R_f value of 0.64 on silica-gel TLC in benzene:ethyl acetate (1:1), and an infrared absorption spectrum as shown in FIG. 5 of the drawings; and (3) the pharmaceutically-acceptable salts thereof.

4,133,877

ANTHRACYCLINE ETHERS AND USE THEREFOR

Paolo Masi; Antonino Suarato; Pietro Giardino; Luigi Bernardi, all of Milan, and Federico Arcamone, Nerviano (Milan), all of Italy, assignors to Societa Farmaceutici Italia S.p.A., Milan, Italy

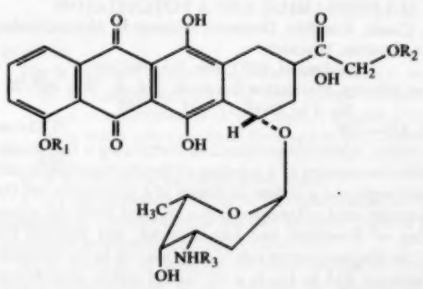
Filed Jul. 22, 1977, Ser. No. 817,972

Claims priority, application United Kingdom, Jul. 8, 1976, 32992/76

Int. Cl.² A61K *31/71;* C07H *15/24*

U.S. Cl. 424—180 **20 Claims**

1. A compound of the formula:



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wherein R_1 is hydrogen or a lower alkyl having from 1 to 4 carbon atoms, R_2 is a lower alkyl having from 1 to 4 carbon atoms, cycloalkyl having 3 to 6 carbon atoms, phenyl, lower alkyl phenyl, lower alkoxy phenyl or halophenyl, and R_3 is

hydrogen or trifluoroacetyl and pharmaceutically acceptable acid addition salts thereof.

18. A method of inhibiting the growth of transplanted lymphocytic leukemia P 388 which comprises administering to a host afflicted therewith, a compound according to claim 1, in an amount sufficient to inhibit the growth thereof.

4,133,878

STABILIZED ORGANOTHIOPHOSPHORUS FORMULATIONS

Stanley T. D. Gough, Somerville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 642,958, Dec. 22, 1975, abandoned. This application Sep. 16, 1977, Ser. No. 833,840

Int. Cl.[2] A01N *9/36*

U.S. Cl. 424—225 **5 Claims**

1. A composition comprising an insecticidally and nematocidally effective amount of an organothiophosphorus compound having the following general formula:

$$(RS)_2P(O)OR'$$

wherein R′ is selected from the group consisting of methyl and ethyl, R is selected from the group consisting of propyl and butyl when R′ is methyl, and R is propyl when R′ is ethyl, a solid particulate attapulgite clay carrier therefor and a mixture of from about 2 to 10 weight percent, by weight of the total composition, of propylene glycol and from about 2 to 10 weight percent, by weight of the total composition, of an acid selected from the group consisting of acetic acid, acrylic acid, ethylhexanoic acid, and formic acid; wherein said propylene glycol and said acid are present in equal weight amounts.

4,133,879

PROCESS FOR PRODUCING STABLE SOLUTIONS OF A SULPHONAMIDE AND A POTENTIATOR

Jose B. Casals, Roskilde, Denmark, assignor to Aktieselskabet Rosco, Tastrup, Denmark

Filed Jan. 31, 1977, Ser. No. 764,244

Claims priority, application Denmark, Feb. 6, 1976, 497/76

Int. Cl.[2] A61K *31/625, 31/505*

U.S. Cl. 424—229 **5 Claims**

1. A stable, injectable preparation, comprising a therapeutically effective amount of a solution of the diethanolamine salt of sulfafurazole and a lactate or citrate of a potentiator for the sulphonamide, said potentiator being selected from the group consisting of diveridine and trimethoprim, and wherein the ratio of the diethanolamine salt of sulfafurazole to the potentiator is between 20:1 to 1:1, in a mixture of water, propyleneglycol, and N-methylpyrrolidone, the water content of the preparation being from 10 to 50% w/v, the propyleneglycol content from 15 to 30% w/v, and the N-methylpyrrolidone content from 20 to 40% w/v, and the pH of the preparation being 5.5 to 7.5.

4,133,880

N^2-SUBSTITUTED-L-ARGININE DERIVATIVES AND THE PHARMACEUTICALLY ACCEPTABLE ACID ADDITION SALTS THEREOF

Shosuke Okamoto, 15-18, Asahigaoka 3-chome, Tarumi-ku, Kobe-shi, Hyogo; Akiko Hijikata, Kobe; Ryoji Kikumoto, Machida; Yoshikuni Tamao, Yokohama; Kazuo Ohkubo, Machida; Tohru Tezuka, Yokohama, and Shinji Tonomura, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo and Shosuke Okamoto, Hyogo, both of, Japan

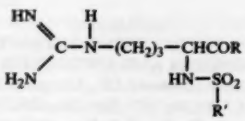
Division of Ser. No. 703,704, Jul. 8, 1976, Pat. No. 4,069,323, which is a continuation-in-part of Ser. No. 671,436, Mar. 29, 1976, Pat. No. 4,066,758, which is a division of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Jul. 28, 1977, Ser. No. 819,872

Claims priority, application Japan, Aug. 8, 1975, 50-96417; Sep. 2, 1975, 50-106139; Sep. 11, 1975, 50-110242; Oct. 1, 1975, 50-118525; Oct. 7, 1975, 50-121173; Nov. 8, 1974, 49-128774; Nov. 8, 1974, 49-128775; Nov. 29, 1974, 49-136695; Nov. 29, 1974, 49-136697; Feb. 25, 1975, 50-023268; Feb. 26, 1975, 50-023635; Mar. 5, 1975, 50-026768; Mar. 11, 1975, 50-029357; Mar. 11, 1975, 50-029358

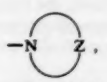
Int. Cl.[2] A61K *31/495, 31/505, 31/535, 31/54*

U.S. Cl. 424—244 **5 Claims**

1. An N^2-substituted-L-argininamide having the formula:



and the pharmaceutically acceptable acid addition salts thereof, wherein R is

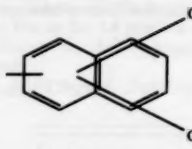


wherein Z is a divalent group which consists of at least two groups selected from methylene —CH_2— and monosubstituted methylene

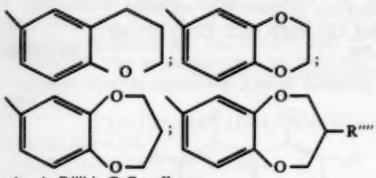
wherein R_4 is selected from the group consisting of C_1–C_{10} alkyl and C_1–C_{10} alkoxy, and at least one group selected from the group consisting of oxy —O—, thio —S—, alkyl substituted imino

wherein R_5 is C_1–C_{10} alkyl, and acyl substituted imino

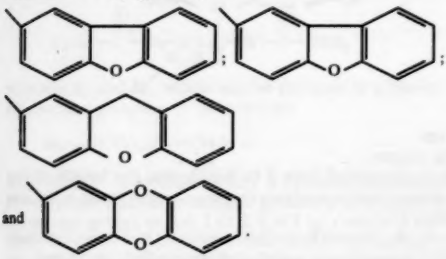
wherein R_6 is C_1–C_{10} alkyl, which are combined in an arbitrary order, the number of the combined groups being up to 20; and R′ is selected from the group consisting of



wherein R'' and R''' when considered separately are C_1–C_{10} alkyl, or R'' and R''' when taken together are C_1–C_{10} alkylene;



wherein R'''' is C_1C_{10} alkoxy;



and

5. A pharmaceutical composition which comprises an amount of a compound of claim 1, effective for inhibiting activity and suppressing activation of thrombin in vivo, and a pharmaceutically acceptable carrier.

4,133,881

AZETIDINYL ACETONITRILE AND ACETAMIDE ANTIARRHYTHMIA COMPOSITIONS AND METHODS

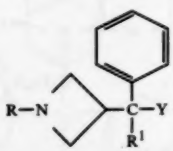
Albert D. Cale, Jr., Mechanicsville, and Herndon Jenkins, Richmond, both of Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Filed Apr. 27, 1977, Ser. No. 791,431

Int. Cl.[2] **A61K** *31/44, 31/395;* **C07D** *401/06, 205/04*

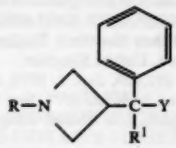
U.S. Cl. 424—244 **36 Claims**

1. A composition for controlling cardiac arrhythmias with minimal side effects, comprising (1) an antiarrhythmic effective amount of between about 1 and 100 mg. of a compound of the formula:



wherein R is hydrogen, lower alkyl, lower cycloalkyl or phenyl-lower alkyl, R^1 is phenyl or 2-pyridyl, Y is carbamoyl, cyano, and pharmaceutically acceptable acid addition salts or quaternary ammonium salts thereof prepared with alkyl and aralkyl halides or sulfates, and (2) a pharmaceutical carrier.

25. A compound selected from α-(1-R-3-azetidinyl)-α-phenyl-α-substituted-acetamides and -acetonitriles of the formula:



wherein R is hydrogen, lower alkyl, lower cycloalkyl or phenyl-lower alkyl, R^1 is phenyl or 2-pyridyl, Y is carbamoyl or cyano, and pharmaceutically acceptable acid addition salts or quaternary ammonium salts thereof prepared with alkyl and aralkyl halides or sulfates.

4,133,882

7-HYDROXYHALOPHENYLACETAMIDO-3-HETEROCYCLICTHIOMETHYL CEPHALOSPORINS

George L. Dunn, Wayne, and John R. E. Hoover, Glenside, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

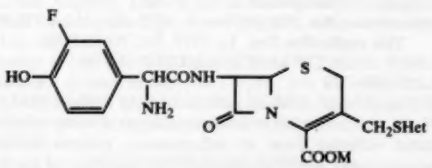
Continuation of Ser. No. 359,567, May 11, 1973, abandoned, which is a continuation-in-part of Ser. No. 262,903, Jun. 14, 1972, Pat. No. 3,867,380, which is a continuation-in-part of Ser. No. 116,598, Feb. 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 99,296, Dec. 17, 1970, abandoned, and a continuation-in-part of Ser. No. 289,499, Sep. 15, 1972, Pat. No. 3,855,213, which is a continuation-in-part of Ser. No. 262,903, , and Ser. No. 116,599, Feb. 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 99,296,. This application Jun. 28, 1976, Ser. No. 700,668

The portion of the term of this patent subsequent to Feb. 18, 1992, has been disclaimed.

Int. Cl.[2] **A61K** *31/545;* **C07D** *501/36*

U.S. Cl. 424—246 **11 Claims**

1. A compound of the formula



in which

Het is triazolyl, tetrazolyl, oxadiazolyl, thiazolyl, oxadiazolyl or thiadiazolyl, each of such groups being unsubstituted or substituted with two methyl groups or a straight chain lower alkyl group of from one to four carbon atoms and

M is hydrogen or an alkali metal cation.

5. An antibacterially effective pharmaceutical composition comprising a compound as claimed in claim 1 and a pharmaceutically acceptable carrier therefor.

9. A method of treating bacterial infections comprising orally administering to an infected or susceptible warm-blooded animal a pharmaceutical composition comprising an antibacterially effective but nontoxic dose from 100 to 500 mg. of a compound as claimed in claim 1 and a pharmaceutically acceptable carrier therefor.

4,133,883
POLYCYCLIC CHROMENES USEFUL AS ANTIDEPRESSANTS AND ANOREXICS

Derek V. Gardner, Bishop Stortford, England, assignor to Beecham Group Limited, United Kingdom

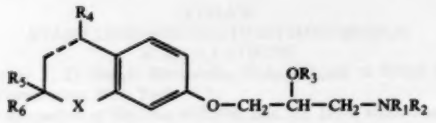
Division of Ser. No. 691,865, Jun. 1, 1976, Pat. No. 4,093,631. This application Nov. 18, 1977, Ser. No. 852,742

Claims priority, application United Kingdom, Jun. 3, 1975, 24005/75

Int. Cl.[2] A61K *27/00*

U.S. Cl. 424—248.52 **89 Claims**

1. A pharmaceutical composition useful for treating depression in humans and animals and for reducing appetite in humans and animals which comprises an antidepressantly effective amount or an anorexically effective amount of a compound of the formula



or a pharmaceutically acceptable salt thereof wherein R_1 is hydrogen, alkyl of 1 to 4 carbon atoms or benzyl; R_2 is hydrogen, alkyl of 1 to 4 carbon atoms or benzyl; R_3 is hydrogen, alkyl 1 to 4 carbon atoms or acyl of 1 to 4 carbon atoms; R_4 is naphthyl, phenyl unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of fluorine, chlorine, bromine, methoxyl, benzyloxyl, trifluoromethyl, methyl, cyano, nitro, acetoxyl, amino, methylamino, ethylamino, dimethylamino, diethylamino, acetamido, hydroxyl, methoxycarbonyl, ethoxycarbonyl, carboxamido, sulphonamido, carboxy, trifluoromethylthio, trifluoromethoxyl, methylsulphonyl, trifluoromethylsulphonyl and methylthio; R_5 is hydrogen or alkyl of 1 to 4 carbon atoms; R_6 is hydrogen or alkyl of 1 to 4 carbon atoms; X is oxygen and the dotted line represents a single or double bond, in combination with a pharmaceutically acceptable carrier.

4,133,884
SUBSTITUTED PYRROLOQUINOXALINONES AND DIONES USED IN TREATING INFLAMMATION IN WARM BLOODED MAMMALS

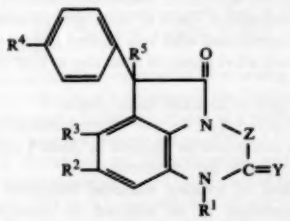
Richard E. Holmes, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 772,154, Feb. 5, 1977, Pat. No. 4,075,206. This application Dec. 12, 1977, Ser. No. 860,005

Int. Cl.[2] A61K *31/33*; C07D *487/04*

U.S. Cl. 424—250 **2 Claims**

1. A method of treating inflammation in a warm blooded mammal which comprises administering to a warm blooded mammal suffering from an inflammatory process an anti-inflammatorially effective amount of a compound of the formula:



wherein R^1 is H or C_1-C_3 alkyl;

when taken singly, R^2 is H, C_1-C_3 alkyl, C_1-C_3 alkoxy, or Cl and R^3 is H; and

R^2 and R^3 when taken together with the carbon atoms to which they are attached form a benzene ring;

R^4 is H, Cl or F;

R^5 is OH, H or phenyl;

Y is O or H_2;

Z is $—CH_2—CH_2—$ or $—CHR^6—$ wherein R^6 is H or C_1-C_3 alkyl.

4,133,885
SUBSTITUTED NAPHTHYRIDINONES

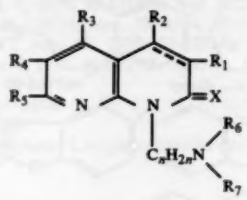
William A. Bolhofer, Frederick; Edward J. Cragoe, Jr., Lansdale, and Jacob M. Hoffman, Jr., North Wales, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 18, 1977, Ser. No. 816,617

Int. Cl.[2] A01N *9/22*; C07D *213/00*

U.S. Cl. 424—256 **10 Claims**

1. A compound having the formula:



wherein

X is oxygen;

n is an integer of from 2 to 6 such that the length of the carbon chain connecting the two nitrogen atoms is not less than 2;

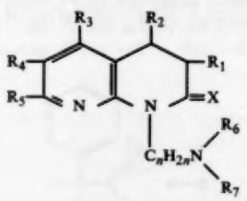
R_1, R_2, R_3, R_4 and R_5 are independently hydrogen, loweralkyl, loweralkoxy, amino, halololoweralkyl, or phenyl; or any two adjacent substituents may be joined to form a benzo substituent;

R_6 and R_7 are independently hydrogen loweralkyl, phenylloweralkyl or, N-loweralkylcarbamoyl,

and the broken line in the 3,4 position of the naphthyridine molecule indicates that the bond may be either a single or a double bond;

and the acid addition and quaternary ammonium salts thereof, provided that when n is 2, R_3, R_5, R_6 and R_7 are all methyl groups, X is oxygen and the 3,4-position is unsaturated, at least one of R_1, R_2 or R_4 is other than hydrogen.

10. A method for the supression of gastric acid secretions which comprises administering to an animal with excess gastric acid secretions an effective amount of a compound having the formula:



wherein

X is oxygen;

n is an integer of from 2 to 6 such that the length of the carbon chain connecting the two nitrogen atoms is not less than 2;

R_1, R_2, R_3, R_4 and R_5 are independently hydrogen, loweralkyl, loweralkoxy, amino, halololoweralkyl, or phenyl; or any two adjacent substituents may be joined to form a benzo substituent;

R_6 and R_7 are independently hydrogen, loweralkyl, phenyl-loweralkyl or, N-loweralkylcarbamoyl,
and the broken line in the 3,4 position of the naphthyridine molecule indicates that the bond may be either a single or a double bond;
and the acid addition and quaternary ammonium salts thereof.

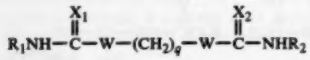
4,133,886

GUANIDINO, THIOUREIDO, ISOTHIOUREIDO AND NITROVINYLAMINO DERIVATIVES OF PYRIDINE

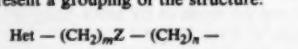
Graham J. Durant, and Charon R. Ganellin, both of Welwyn Garden City, England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Division of Ser. No. 678,564, Apr. 20, 1976, Pat. No. 4,070,472, which is a division of Ser. No. 542,971, Jan. 22, 1975, Pat. No. 3,968,227. This application Sep. 26, 1977, Ser. No. 836,627
Claims priority, application United Kingdom, Feb. 7, 1974, 5596/74
Int. Cl.[2] A61K *31/44;* **C07D** *213/78*
U.S. Cl. 424—263 **12 Claims**

1. A compound of the formula:



wherein R_1 and R_2, which may be the same or different, each represent a grouping of the structure:



wherein Het is pyridine which is optionally substituted by lower alkyl, hydroxyl, halogen or amino; Z is sulphur or a methylene group; m is 0, 1 or 2; n is 2 or 3; and the sum of m and n is 3, 4 or 2; X_1 and X_2, which may be the same or different, are each NY wherein Y is hydroxy, cyano, $CONH_2$ or SO_2R_3 or one of X_1 and X_2 is sulphur, $CHNO_2$, NH or N-lower alkyl; R_3 is lower alkyl, phenyl, tolyl, trifluoromethyl or amino; W is NH, and when one of X_1 and X_2 is NH, the adjoining W may also be sulphur; and q is an integer from 2 to 8; or a pharmaceutically acceptable acid addition salt thereof, provided that the sum of m and n is 2 only when Y is other than hydroxy.

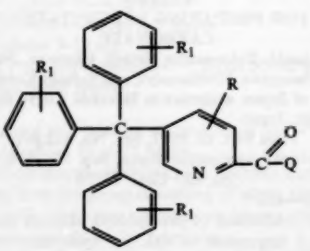
4,133,887

TRITYL PICOLINIC ACID DERIVATIVES AND THEIR USE AS ANTI-ACNE AGENTS

Margaret H. Sherlock, Bloomfield, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 636,010, Nov. 28, 1975, Pat. No. 4,044,140. This application Aug. 12, 1977, Ser. No. 824,027
Int. Cl.[2] A61K *31/44;* **C07D** *213/55*
U.S. Cl. 424—266 **10 Claims**

1. A compound of the formula:



and the pharmaceutically acceptable salts thereof, wherein R is hydrogen or alkyl; each R_1 is a member selected from the group consisting of hydrogen, halogen, hydroxy, alkyl, alkoxy, trifluoromethyl and phenyl; Q is an —O—alkylene NR_2R_3 group, and R_2 and R_3 which may be the same or different are members selected from the group consisting of hydrogen and alkyl, wherein said alkyl, alkylene or alkoxy groups consist of up to 12 carbon atoms.

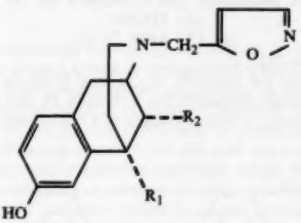
4,133,888

ANALGESIC AND MORPHINE ANTAGONISTIC 2'-HYDROXY-2-(5-ISOXAZOLYL-METHYL)-6,7-BENZO-MORPHANS AND SALTS THEREOF

Herbert Merz, Ingelheim am Rhein, and Klaus Stockhaus, Bingen, both of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Filed Apr. 12, 1978, Ser. No. 895,631
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1977, 2716687
Int. Cl.[2] C07D *221/26;* **A61K** *31/445*
U.S. Cl. 424—267 **5 Claims**

1. A racemic or optically active compound of the formula



wherein
R_1 is methyl, ethyl or propyl; and
R_2 is hydrogen, methyl or ethyl;
or a non-toxic, pharmacologically acceptable acid addition salt thereof.

5. The method of relieving pain or antagonizing the pharmacological effects of morphine in a warm-blooded animal, which comprises perorally, parenterally or rectally administering to said animal an effective analgesic or morphineantagonistic amount of a compound of claim 1.

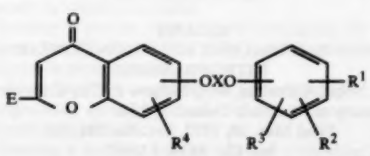
4,133,889

2(5-TETRAZOLYL)CHROMONES

Joachim Augstein, Linford; David Carter, and Thomas B. Lee, both of Loughborough, all of England, assignors to Fisons, Ltd., England

Division of Ser. No. 545,309, Jan. 29, 1975, Pat. No. 4,006,245, which is a division of Ser. No. 276,798, Jul. 31, 1972, Pat. No. 3,882,148. This application Sep. 20, 1976, Ser. No. 725,126
Claims priority, application United Kingdom, Jul. 29, 1971, 35605/71
Int. Cl.[2] A61K *31/41;* **C07D** *207/44*
U.S. Cl. 424—269 **6 Claims**

1. A compound of the formula:



wherein X is straight chain alkylene of 3 to 7 carbon atoms and is unsubstituted or is substituted by one hydroxy,
R^1, R^2 and R^3 are the same or different and are hydrogen, hydroxy, methoxy, benzyloxy, acetyl, acetylamino, allyl or propyl, provided that at least one of R^1, R^2 and R^3 are other than hydrogen or hydoxy,

R^4 is hydrogen, allyl or propyl, and

E is the 5-tetrazoyl group, or pharmaceutically acceptable salts thereof.

6. A pharmaceutical composition for antagonizing the slow reacting substance of anaphylaxis comprising an effective amount, for antagonizing the slow reacting substance of anaphylaxis, of a compound according to claim 1, as active ingredient, in admixture with a pharmaceutically acceptable adjuvant, diluent or carrier.

4,133,890

HYPOLIPIDEMIC COMPOSITIONS AND METHOD EMPLOYING DERIVATIVES OF 4-(((1,3-BENZODIOXOL-5-YL)METHYL)AMINO)BENZOIC ACID

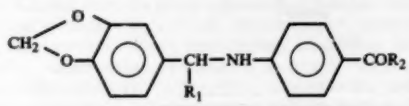
Eugene R. Wagner, Carmel, Ind.; Alfred A. Renzi, Midland, and Bobbie J. Allen, Detroit, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 757,119, Jan. 5, 1977, abandoned, which is a continuation-in-part of Ser. No. 650,090, Jan. 19, 1976, abandoned. This application Jul. 25, 1977, Ser. No. 818,684

Int. Cl.² A61K *31/36*

U.S. Cl. 424—282 **15 Claims**

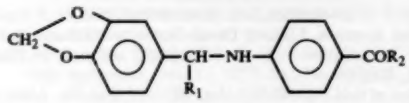
1. A method for lowering serum lipid levels in a mammal which comprises administering internally to the mammal a hypolipidemically effective amount of a compound having the formula



wherein

R_1 represents hydrogen or methyl and R_2 represents hydroxy, lower alkoxy, amino, N,N-diloweralkylaminoloweralkoxy, or carboxyloweralkylamino; and when R_2 is hydroxy, the symmetrical anhydrides or pharmaceutically-acceptable salts of said compound.

10. A hypolipidemic composition comprising, a suitable pharmaceutical carrier and a hypolipidemically effective amount of a compound having the formula



wherein

R_1 represents hydrogen or methyl and R_2 represents hydroxy, lower alkoxy, amino, N,N-diloweralkylaminoloweralkoxy, or carboxyloweralkylamino; and when R_2 is hydroxy, the symmetrical anhydrides or pharmaceutically-acceptable salts of said compound.

4,133,891

PERITONEAL DIALYSIS SOLUTION CONTAINING NITROPRUSSIDE

Karl D. Nolph, Columbia, Mo., assignor to The Curators of the University of Missouri, Columbia, Mo.

Filed Mar. 28, 1977, Ser. No. 781,630

Int. Cl.² A61K *31/295*

U.S. Cl. 424—295 **4 Claims**

1. A peritoneal dialysis fluid containing the following ingredients in the approximate concentration of:

140 mEq/L sodium

101 mEq/L chloride

45 mEq/L acetate

1.5 mEq/L magnesium

4 mEq/L calcium; and

the vasodilating drug nitroprusside in the approximate concentration of 3 to 6 mg. per liter.

4,133,892

COMBATING PESTS WITH DI-[2-THIOUREIDO-(N-ALKOXYCARBONYL)-N-PHENYLUREIDO]-COMPOUNDS

Werner Perkow, Ahrensburg; Hans Hopp, Itzehoe; Walter Ingwersen, Nindorf, all of Germany, and C.F. Spiess & Sohn, 03, Kleinkarlbach, both of Germany, assignors to Norddeutsche Affinerie, Hamburg

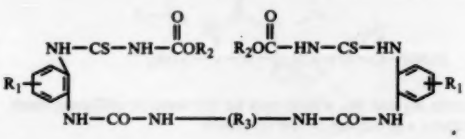
Division of Ser. No. 687,846, May 19, 1976, Pat. No. 4,044,045. This application May 23, 1977, Ser. No. 799,894

Claims priority, application Fed. Rep. of Germany, May 24, 1975, 2523072

Int. Cl.² A01N *9/12*

U.S. Cl. 424—300 **3 Claims**

1. A fungicidal and miticidal composition comprising a fungicidally or miticidally effective amount of a di-[2-thioureido-(N-alkoxycarbonyl)-N-phenylureide] of the formula



wherein

R_1 is hydrogen, halogen, or an alkoxy or alkyl radical having 1 to 4 C atoms,

R_2 is an alkyl radical having 1 to 4 C atoms, and

R_3 is an alkylene radical having 3 to 10 C atoms, or a cycloalkylene or phenylene radical having 6 to 20 carbon atoms,

in admixture with a diluent.

4,133,893

TOPICAL TREATMENT OF SKIN DISEASES

Arthur S. Spangler, deceased, late of Weston, Mass. (by Barbara F. Spangler, executrix), assignor to Calbiochem Behring Corp., La Jolla, Calif.

Filed May 26, 1977, Ser. No. 800,807

Int. Cl.² A61K *31/03*

U.S. Cl. 424—354 **2 Claims**

1. A method for topically treating skin diseases selected from the group consisting of acne vulgaris, acne rosacea and herpes simplex which method comprises applying to affected areas of the skin a pharmaceutical composition comprising an effective amount of 1,1-dichloro-2-(o-chlorophenyl)-2-(p-chlorophenyl)ethane and a pharmaceutically acceptable carrier or diluent suitable for topical application.

4,133,894

PROCESS FOR PREPARING PRECIPITATED CALCIUM CARBONATE

Hiroji Shibazaki, Takarazuka; Setsuji Edagawa, Nishinomiya; Hisashi Hasegawa, Nishinomiya, and Satoshi Kondo, Nishinomiya, all of Japan, assignors to Shiraishi Kogyo Kaisha, Ltd., Amagasaki, Japan

Filed Sep. 13, 1977, Ser. No. 832,902

Claims priority, application Japan, Sep. 25, 1976, 51-115236

Int. Cl.² C01F *11/18*

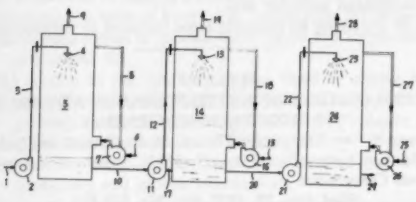
U.S. Cl. 423—432 **4 Claims**

1. In the production of precipitated calcium carbonate by contacting a suspension of calcium hydroxide with carbon dioxide, a process for continuously producing precipitated calcium carbonate less than about 0.1μm in particle size which comprises:

(a) the first step of spraying a suspension of calcium hydroxide having a solids concentration of 0.1 to 10 wt.% and a

temperature of 1 to 30° C. in the form of droplets about 0.2 to about 1.0 mm in diameter against a gas containing 10 to 40 vol.% of carbon dioxide in countercurrent contact therewith while the gas is being passed upward through a column at a superficial velocity of about 0.02 to about 0.5 m/sec to effect carbonation to 5 to 15%,

(b) the second step of spraying the suspension from the first step having a temperature of 1 to 30° C. in the form of droplets about 1.0 to about 2.0 mm in diameter against a gas containing 10 to 40 vol.% of carbon dioxide in countercurrent contact therewith while the gas is being passed upward through a column at a superficial velocity of about 1.0 to about 3.0 m/sec to effect the carbonation to 95 to 98%, and



(c) the third step of spraying the suspension from the second step having a temperature of 1 to 30° C. in the form of droplets about 1.5 to about 2.0 mm in diameter against a gas containing 10 to 40 vol.% of carbon dioxide in countercurrent contact therewith while the gas is being passed upward through a column at a superficial velocity of about 1.5 to about 3.0 m/sec to complete the carbonation.

4,133,895

PREPARATION OF BLUE CHEESE FLAVOR

Frank V. Kosikowski, Ithaca, N.Y., and Ramesh C. Jolly, Groton, Conn., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Sep. 10, 1974, Ser. No. 504,714
Int. Cl.[2] A23C *9/12, 21/00, 23/00*
U.S. Cl. 426—33 **6 Claims**

1. A method for producing a product having a blue cheese flavor comprising the following steps in recited sequence

(a) forming a mixture comprising food fat, sodium chloride and water,

(b) pasteurizing said mixture,

(c) adding an effective amount of at least one lipase selected from the group consisting of microbial lipase and animal lipase and an effective amount of *Penicillium roqueforti* to said mixture, the relative proportions per 100 grams of said components of said mixture being

food fat — about 10–40 grams
sodium chloride — about 0–3 grams
lipase — about 5–10 mg.
spores of *Penicillium roqueforti* — about 50–70 mg.; and
the balance being water,

(d) fermenting said mixture at about room temperature for a period of about 48 to 72 hours,

(e) selectively concentrating by ultrafiltration a milk product selected from the group consisting of whey, skim milk and whole milk to produce a retentate having about 5–25% protein by weight of the retentate;

(f) mixing the fermented mixture with the ultrafiltration retentate to produce a resultant mixture having a fat content of from about 5–40%, and

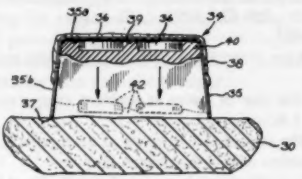
(g) pasteurizing the resultant mixture to form said flavor product.

4,133,896

FOOD PACKAGE INCLUDING CONDIMENT CONTAINER FOR HEATING FOOD

Charles N. Standing, and Lawrence C. Brandberg, both of Minneapolis, Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Continuation of Ser. No. 656,560, Feb. 9, 1976, abandoned, which is a continuation of Ser. No. 456,924, Apr. 1, 1974, abandoned. This application Jan. 24, 1978, Ser. No. 871,889
Int. Cl.[2] B65B *29/08, 25/22*
U.S. Cl. 426—107 **8 Claims**



1. A food package for storing and heating foods to serving temperature from a frozen or refrigerated state in both microwave and conventional ovens comprising: at least one food body comprising bread; a condiment container means resting on said food body, said condiment container means being inverted and having a bottom and side wall and a mouth facing downwardly; said condiment container means being formed from sheet material; a condiment adhered to the bottom wall of said condiment container means in spaced relationship above the food body whereby moisture migration is prevented from the condiment to the said food body when the condiment is thus adhered to the bottom wall of the condiment container means; a microwave reflective metallic sheet element enclosing at least a part of the condiment container means opposite the mouth to reduce the rate at which the condiment absorbs heat and said condiment being heat releasable from the condiment container means during heating in the oven and being free to fall to the mouth of the condiment container means onto the food body comprising bread where microwave energy can be absorbed at a faster rate whereby the exposure of the condiment to microwave energy is initially limited thereby preventing overheating of the condiment during the initial heating of the bread and a microwave transparent container enclosing said food body and said condiment container means.

4,133,897

PREPARATION OF JUICY, SELF-BASTING SAUSAGE-LIKE FOOD PRODUCTS

John R. Flanyak, Wheaton, and Herbie R. Norton, Hoffman Estates, both of Ill., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Oct. 28, 1977, Ser. No. 846,595
Int. Cl.[2] A23J *3/00*
U.S. Cl. 426—250 **6 Claims**

1. A process for preparing a juicy, self-basting sausage-like food product, which comprises

(a) forming a protein binder slurry containing 20 to 32% water, 3 to 8% albumin, 0.5 to 4% caseinate and 0 to 2.5% vegetable protein isolate;

(b) adding 3 to 15% vegetable oil to the slurry;

(c) vigorously agitating the oil-containing slurry to form a protein-oil emulsion;

(d) forming a textured protein mixture containing 30 40% cooked gluten in the form of ground pieces, 1 to 14% textured vegetable protein and 0 to 4% water;

(e) blending the protein-oil emulsion and the textured protein mixture together;

(f) blending 3 to 15% vegetable oil with the combined mixture;

(g) shaping the resulting mixture to a desired form; and

(h) heating the shaped mixture to set the protein in a stable physical form, said percents being weight percent based on the total weight of the product.

4,133,898

PROCESS FOR PREPARING QUICK-COOKING RICE

Robert A. Carlson, El Cerrito; Robert L. Roberts, Moraga, and Daniel F. Farkas, Piedmont, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 26, 1977, Ser. No. 762,899
Int. Cl.[2] A23L *1/10, 1/20*
U.S. Cl. 426—462 **5 Claims**

1. A process for preparing quick-cooking white rice, which comprises

(a) soaking the rice in water at ambient temperature for a period of 1 hour,

(b) cooking the soaked rice in water at a temperature of 100° C. for a period of 4 to 8 minutes, and

(c) drying the cooked rice in a centrifugal fluidized bed drier at a temperature of about 140°–150° C. and an air velocity of about 610–915 meters per minute wherein

the rice is first treated with hot air while being tumbled at a centrifugal force of about 0.15 to 0.30 × *g* for a period of about 1-2 minutes and then

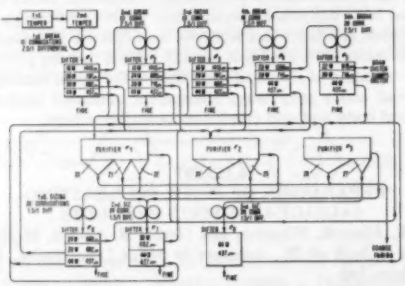
treated with hot air while being tumbled at a centrifugal force of about from 2–30 × *g* for a period of about 3–6 minutes.

4,133,899

FARINA MILLING PROCESS

Ralph M. Wolfing; Clifford J. Batten, both of Toledo, Ohio, and Meade C. Harris, Jr., Rutherford, N.J., assignors to Nabisco, Inc., East Hanover, N.J.

Continuation of Ser. No. 667,392, Mar. 16, 1976, abandoned. This application Jul. 25, 1977, Ser. No. 818,416
Int. Cl.[2] A23P *1/00;* **B02C** *4/06*
U.S. Cl. 426—507 **10 Claims**



1. The process of milling wheat other than durum and red durum wheat to produce at least about 30 percent coarse farina of which between about 77% and 93% is within the range of 840 to 420 microns comprising the steps of:

(a) tempering the wheat to condition the endosperm of the wheat berry so as to reduce shattering upon grinding and to toughen the bran coat;

(b) passing the tempered wheat through a series of three sets of deeply and coarsely corrugated break rolls having a substantially equal number of corrugations per inch of about 10 corrugations per inch said corrugation being of a depth of at least about 480 microns and having teeth arranged to run in sharp to sharp configuration;

(c) separating the particles exiting from the break rolls into a plurality of size ranges which include properly sized particles in said coarse farina ranges, substantially oversized particles being predominantly over about 1400 microns, slightly oversized particles being predominantly in the range of about 840 to about 1400 microns, and undersized particles being predominantly below about 420 microns;

(d) the first set of break rolls receiving the whole wheat berries and the second and third break roll sets receiving the substantially oversized particles exiting from the first and second sets of break rolls;

(e) reducing the size of the slightly oversized particles by means of a sizing roll operation;

(f) separating the particles exiting from the sizing roll operation into size ranges including properly sized particles in said coarse farina range, slightly oversized particles, and undersized particles; and

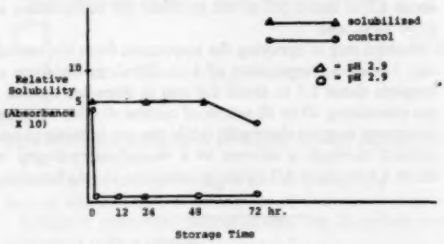
(g) air purifying all properly sized particles to remove bran.

4,133,900

STABILIZATION OF ERYTHROSINE IN AQUEOUS ACIDIC FOOD SYSTEMS

Il-Young Maing, Tarrytown; Thomas H. Parliment, and Robert J. Soukup, both of New City, all of N.Y., assignors to General Foods Corporation

Filed Aug. 29, 1977, Ser. No. 828,571
Int. Cl.[2] A23C *1/275, 2/00*
U.S. Cl. 426—540 **27 Claims**



1. A process of rendering erythrosine soluble and stable in an aqueous food substance having a pH of less than 4.5 which comprises combining erythrosine, an aqueous medium and a hydrophilic surfactant selected from the group consisting of polyoxyethylene (20) sorbitan monostearate, polyoxyethylene (20) sorbitan tri-stearate and polyoxyethylene (20) sorbitan monooleate and mixtures thereof, under conditions of shear effective to form a colloidal system and to render the erythrosine soluble in said food substance for at least 24 hours when the food substance is held at a temperature between about 40° F and about 45° F, the ratio of aqueous medium to surfactant being sufficient to produce said colloidal system.

4,133,901

PROTEIN FILM PROCESS

Richard W. Fetzer, Carpentersville, and Kolar S. Ramachandran, Palatine, both of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Continuation of Ser. No. 672,417, Mar. 31, 1976, abandoned, which is a continuation-in-part of Ser. No. 556,644, Mar. 10, 1975, abandoned. This application Aug. 22, 1977, Ser. No. 826,406
Int. Cl.[2] A23J *3/00*
U.S. Cl. 426—573 **25 Claims**

1. A process for preparing a versatile protein product comprising:

(a) providing a mix of about 30% to about 95% of at least one protein source, 0 to about 20% of at least one edible fat, and 0 to about 5% of at least one edible salt;

(b) adding water to the mix to form a slurry;

(c) heating the slurry for about 10–45 minutes at a temperature of about 160–180° F. to gel the slurry;

(d) forming the gelled slurry into at least one film comprising from about 8-50% by weight of moisture;

(e) forming a product from the film; and

(f) recovering the product.

4,133,902

PROCESS CHEESE WITH LIVER ADDITIVE

Josef Hofmeister, Moosburg, Fed. Rep. of Germany, assignor to Hofmeister Käsewerk OHG, Moosburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 681,582, May 20, 1976, abandoned. This application Mar. 25, 1977, Ser. No. 781,504
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1975, 2519087
Int. Cl.[2] A23C *19/00, 19/12*
U.S. Cl. 426—582 5 Claims

1. A method of making a cheese food having a taste closely resembling the taste of liverwurst, comprising the steps of

(a) heating a mass of ground hard cheese to a temperature of at least 80° C.;

(b) adding to the resultant molten mass of cheese water, emulsifier salts, and finely chopped raw liver particles to produce a mixture containing about 30–50% cheese, about 15–40% water and about 10–15% liver, said raw liver particles being substantially instantaneously cooked on contacting said molten cheese mass;

(c) heating the resulting mixture containing cheese and liver to above 100° C.;

(d) cooling the mixture; and

(e) packaging the cooled mixture to obtain said cheese food.

4,133,903

PROCESS FOR PREPARING BITTER BEVERAGES

Kurt Thiele, and Heinz O. Bernhard, both of Zofingen, Switzerland, assignors to Siegfried Aktiengesellschaft, Zofingen, Switzerland

Filed Dec. 6, 1976, Ser. No. 747,986
Claims priority, application Switzerland, Dec. 4, 1975, 15764/75
Int. Cl.[2] A23L *2/00*
U.S. Cl. 426—590 20 Claims

1. An aqueous solution containing substantially pure and stable cynaropicrin in a concentration of at least about 10 mg/liter, the solution having a pH value of from about 2.0 to 5.7.

4,133,904

TREATMENT OF SINGLE CELL PROTEIN

David C. Steer, and Hugh L. Williams, both of Norton, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jul. 12, 1976, Ser. No. 704,673
Claims priority, application United Kingdom, Jul. 16, 1975, 29841/75
Int. Cl.[2] A23J *1/00*
U.S. Cl. 426—656 11 Claims

1. A process for the treatment of single cell protein consisting essentially of:

(A) treating an aqueous medium containing microorganism cells with an acid to lower its pH to a value not greater than 5,

(B) heating said aqueous medium containing microorganism cells for a period of from two to ten minutes to a temperature of at least 60° C, steps (A) and (B) being performed in either order or at the same time, and subsequently

(C) treating said aqueous medium containing microorganism cells with an alkali to raise pH of the medium to a value of at least 6 whilst maintaining the temperature of the medium at a value of at least 60°, and

(D) separating the cells from the aqueous medium.

4,133,905

PROCESS FOR THE MANUFACTURE OF COOKED SUGAR PASTILLES

Jacques E. Canonne, Paris, France, assignor to Corexi S.A., Luxembourg, Luxembourg

Filed Oct. 17, 1977, Ser. No. 843,031
Claims priority, application France, Jun. 24, 1977, 77 19441
Int. Cl.[2] A23G *3/00*
U.S. Cl. 426—660 10 Claims

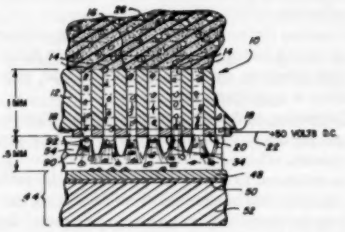
1. A process of manufacturing sugar pastilles comprising dusting a mass of cooked sugar with dextrose, said mass of cooked sugar having a temperature of between 120° and 150° C., mixing the sugar and dextrose, dividing the mixture into pastilles, precandying the pastilles by mixing in a turbine with a sugar syrup and then with powdered sugar, and candying the sugar pastilles with granulated sugar.

4,133,906

METHOD OF TONING AN ELECTROPHOTOGRAPHIC FILM

Manfred R. Kuehnle, Lexington, Mass., assignor to Coulter Systems Corporation, Bedford, Mass.

Division of Ser. No. 323,108, Jan. 12, 1973, Pat. No. 3,878,817. This application Jan. 27, 1975, Ser. No. 544,321
Int. Cl.[2] G03G *13/10*
U.S. Cl. 427—17 6 Claims



1. A method of toning an electrophotographic film having a photoconductive surface upon which there is a latent image which comprises:

A. providing a liquid suspension of surface charged toner particles within a source container having a floor, a rigid, insulative top wall having a foraminous area on the top wall constituting a delivery face and recoverably deformable side walls, the delivery face spaced from the photoconductive surface,

B. flowing the suspension uniformly from said face onto said photoconductive surface substantially simultaneously over the entire area thereof by deforming all said deformable side walls expressing the toner suspension through said delivery face, simultaneously over the foraminous area thereof,

C. insitu applying a d.c. electrical bias voltage of a polarity the same as the polarity of the charge carried by the toner particles to the delivery face of the container immediately before so flowing to enhance the particle movement toward said photoconductive surface, whereby the toner particles adhere to the latent image,

D. removing any suspension which remains on said photoconductive surface thereafter while maintaining the disposition of said source container and film unchanged by permitting insitu recovery of the deformed container.

4,133,907

HIGH RESOLUTION ELECTRON BEAM RESIST

Terry L. Brewer, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 412,934, Nov. 5, 1973, abandoned. This application Nov. 21, 1977, Ser. No. 853,673

Int. Cl.[2] B05D 3/06

U.S. Cl. 427—43 3 Claims

1. The method of forming a patterned thin film of poly(methyl α-chloroacrylate) as a positive resist coating on a substrate surface, comprising the steps of:

(a) applying a solution of poly(methyl α-chloroacrylate) to said support surface;

(b) drying the applied solution to remove substantially all of the solvent, leaving a dried thin film of poly(methyl α-chloroacrylate) 1,000 to 5,000 angstroms thick;

(c) selectively exposing the dried polymer film to an electron beam current of less than 5×10^{-5} coulombs per cm^2 seconds, but sufficient to decompose the polymer in a predetermined pattern requiring resolutions on the order of 0.5 micron or less;

(d) then developing the image by exposing the polymer pattern to a solvent which selectively removes only the exposed areas, while leaving the unexposed polymer film in the desired pattern.

4,133,908

METHOD FOR DEPOSITING A METAL ON A SURFACE

Bruce S. Madsen, Tinicum Township, Upper Bucks County, Pa., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Nov. 3, 1977, Ser. No. 848,001

Int. Cl.[2] C23C 3/02; G03C 5/24

U.S. Cl. 427—53 16 Claims

1. A method for selectively depositing a metal on a surface of a substrate, which comprises:

(a) coating the surface with a sensitizing solution comprising at least a reducible salt of a non-noble metal and a radiation-sensitive reducing agent for said reducible salt to form a sensitized surface;

(b) exposing said sensitized surface to a source of light radiant energy to reduce said metal salt to a reduced metal salt species, wherein at least one of said above steps (a) or (b) is restricted to a selected pattern on the surface to form a catalytic real image capable of catalyzing the deposition of a metal thereon from an electroless metal deposition solution; and

(c) treating said catalytic real image, prior to exposing said real image to an electroless metal deposition solution, with a stabilizer comprising at least (a) a reducing agent for the non-noble metal ions of said reducible salt, (b) a complexing agent and (c) an accelerator comprising a compound containing a cyanide radical (CN^-) complexed with a metal selected from Group VIII of the Periodic Table of the Elements, to at least stabilize said catalytic real image.

4,133,909

RADIATION CURABLE AQUEOUS COATINGS

Arthur T. Spencer, New Providence, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 26, 1977, Ser. No. 762,699

Int. Cl.[2] C08F 8/00

U.S. Cl. 427—54 13 Claims

1. A method of coating comprising applying to a substrate a wet coating of a high solids, low viscosity, radiation curable, coating composition comprising, a polyethylenically unsaturated resin, from about 4% to about 30% of water in compatible mixture with said resin, and at least 5% of a water soluble monoethylenically unsaturated monomer selected from acrylamide and N-methylol acrylamide dissolved in the water, said percentages being based on the weight of the resin, and subjecting said wet coating to radiation to cure the same.

4,133,910

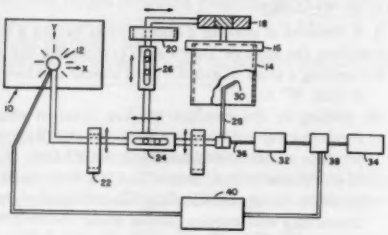
THICK FILM DEPOSITION OF MICROELECTRONIC CIRCUIT

Victor W. Ruwe, Huntsville, and Thomas D. Graben, Woodville, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 1, 1977, Ser. No. 856,438

Int. Cl.[2] B41M 3/08; B05D 5/12

U.S. Cl. 427—96 2 Claims



1. A process for depositing a thick film electronic material to form an electronic circuit on the inside wall of a right circular substrate, said process comprising:

projecting a light sensor onto a circuit pattern;

moving said light sensor both in an x and y direction;

rotating a right circular substrate in response to the movement of said light sensor;

positioning a depositing nozzle inside of said right circular substrate in close proximity to the inner wall of said substrate;

translating said nozzle in said substrate in response to movement of said light sensor; and

actuating control means to cause film material to flow through said nozzle and be deposited on the inside wall of said substrate.

4,133,911

MANUFACTURE OF MAGNETIC DISCS

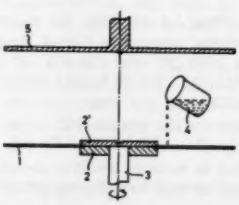
Eberhard Koester, Frankenthal; Paul Deigner, Weisenheim; Roland Falk, Achern; Karl Uhl, Frankenthal; Dieter Schaefer, Ludwigshafen; Dieter Mayer, Ludwigshafen; Herbert Motz, Ludwigshafen, and Peter Felleisen, Lampertheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 16, 1975, Ser. No. 641,356

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1974, 2459541

Int. Cl.[2] H01F 10/02

U.S. Cl. 427—130 8 Claims



1. A process for the production of magnetic layers for magnetic discs which comprises: applying a pourable dispersion of a finely divided magnetic pigment in a solution of an organic binder in a volatile solvent to a rotating base disc, distributing the dispersion to form a thin layer by rotating the base disc, and drying and curing the layer,

wherein said process further comprises:

rotating along with said base disc and in substantially parallel, axially-spaced relationship thereto, a separate, rigid,

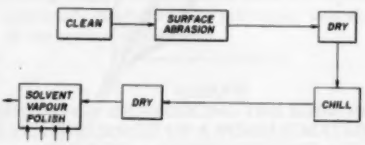
generally disc-shaped member having a surface area which is at least equal to that of the base disc and rotates at a distance of up to 20 mm above the surface of the base disc to be coated, so as to define between the surface of said base disc, on which the magnetic layer is to be formed, and the opposing surface of said member a generally cylindrical air space providing on said surface of said disc an aerodynamic boundary layer which rotates in substantially stationary relationship to said surface of said disc, whereby the formation of coating streaks on said layer is substantially avoided.

4,133,912

REFINISHING OF THE SURFACES OF BODIES OF A THERMOPLASTIC

Manfred Stuart, Burnaby, Canada, assignor to Stuart Plastics Ltd., Burnaby, Canada

Filed Jul. 20, 1977, Ser. No. 817,204
Claims priority, application Canada, Jul. 21, 1976, 257509
Int. Cl.² B32B *35/00*
U.S. Cl. 427—140 **8 Claims**



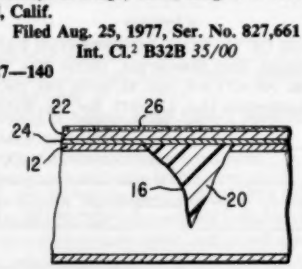
1. In a process for refinishing the surface of a body of a thermoplastic resin selected from acrylonitrile-butadiene-styrene (ABS) and polystyrene by subjecting the surface to treatment with a sol[illegible]e improvement that comprises cleaning the body then c[illegible] the surface and at least the material underlying the su[illegible] to a temperature in the range about −40° F. to about 40[illegible] then contacting the surface of the body with the solvent in vapor form for a time sufficient to dissolve the surface but not to warm appreciably the inner layer of the body.

4,133,913

METHOD FOR PROVIDING AUTOMOBILE DASHBOARDS AND THE LIKE WITH A TEXTURIZED FINISH

David R. Moore, San Diego, Calif., assignor to Bruce R. Moore, Carlsbad, Calif.

Filed Aug. 25, 1977, Ser. No. 827,661
Int. Cl.² B32B *35/00*
U.S. Cl. 427—140 **12 Claims**



1. A method for repairing automobile dashboards and like plastic items having a texturized surface so as to provide the repaired areas with a surface substantially identical in appearance to the original surface, comprising the steps of:

(a) filling in cracks and other indentations with a resinous filler such that a smooth surface is formed;

(b) applying a base coat of an acrylic resin lacquer over the area having the now-filled cracks and indentations;

(c) applying a texturize-producing resin coating over said base coat so as to form a texturized finish on the repaired area which is substantially identical in texture to the surface of the item being repaired; and

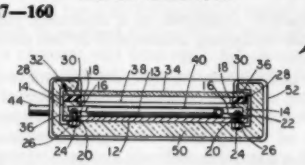
(d) applying a thin coating having a coloring agent over said texturized finish so as to form a continuous colored texturized finish over the entire surface including said cracks and indentations.

4,133,914

METHOD FOR INSULATING A SOLAR ENERGY COLLECTING DEVICE

David A. Zani, P.O. Box 165 Kingshill, St. Croix, V.I. 00850

Continuation-in-part of Ser. No. 650,380, Jan. 19, 1976, abandoned. This application Oct. 25, 1977, Ser. No. 845,447
Int. Cl.² B05B *5/00*
U.S. Cl. 427—160 **4 Claims**



1. A method for insulating a solar energy collecting device having a conduit for passing a heat transfer fluid therethrough during use, said conduit disposed between a collector plate and a transparent panel and having side walls interposed therebetween to define a chamber having one transparent surface portion for transmitting solar energy therethrough, the method comprising the steps of:

spraying a polyurethane foam mixture around the outside of the chamber excluding the solar energy transmitting surface portion; and

air curing the foam to form a rigid and lightweight insulating coating and a rigid structure to enclose the transparent panel, wall member and collector plate; and

applying an elastomeric membrane to the outside surface of the polyurethane insulation and air curing the elastomeric membrane.

4,133,915

METHOD OF PRODUCING COATED OPTICAL ELEMENTS

Björn Nöethe, Ebersberg, and Helmut Saller, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jul. 27, 1977, Ser. No. 819,378
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1976, 26343986
Int. Cl.² B05D *1/36*; G02B *1/10, 5/14, 5/16*
U.S. Cl. 427—160 **6 Claims**

1. A method of producing optical fibers or fiber bundles coated with a protective layer, comprising:

substantially uniformly coating glass fibers or fiber bundles with a high-boiling, highly viscous, optically clear liquid, said liquid being characterized by:

a boiling point above 180° C. at 0.1 Newtons per square millimeter;

a viscosity in the range from 1 to 200 Newtons-seconds at a temperature of 20° C., and

a transparency so that a 1 centimeter thick layer of such liquid has a transparency of more than 70% at a light wavelength ranging from 0.4 to 1.5 micrometers, and

encapsulating the so-coated fibers or fiber bundles with a curable resin material and curing such resin to form an outer coating about the so-coated fibers or fiber bundles.

4,133,916

COATING PROCESS WITH COMPOSITIONS OF ACTIVE HYDROGEN COMPOUND, UNSATURATED OR EPOXY COMPOUND, AND CARBAMOTHIOATE CURING AGENT

Vincent D. McGinniss, Valley City, and Donald R. Stevenson, Dover, both of Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Jul. 5, 1977, Ser. No. 812,801
Int. Cl.[2] B05D 3/02
U.S. Cl. 427—195 7 Claims

1. A process for coating a substrate which comprises:

applying to said substrate a heat-curable coating composition comprising

(a) a reactive compound of a monomer, oligomer, or polymer having groups containing a labile hydrogen atom;

(b) a reactive compound of a monomer, oligomer, or polymer containing unsaturated carbon-carbon groups or epoxy groups; and

(c) a carbamothioate curing agent adapted to generate a plurality of curing units upon being subjected to heating above about a critical temperature, said generated plurality of curing units containing isocyanate groups which are reactive with said groups containing a labile hydrogen atom and mercaptan groups which are reactive with said unsaturated groups and said epoxy groups, at least one of said curing units containing at least two of said isocyanate and/or mercaptan groups, there being about the same number of said groups containing a labile hydrogen atom as there are of said isocyanate groups of said curing units and about the same number of said unsaturated groups and said epoxy groups as there are of said mercaptan groups of said curing units; and

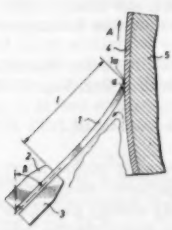
heating said coated substrate to a temperature above about said critical temperature to generate said plurality of curing units, said curing units reacting with said reactive compounds to cure said coating on said substrate.

4,133,917

METHOD AND APPARATUS FOR COATING A MOVING WEB

Hans I. Wallstén, Lausanne, Switzerland, assignor to Inventing S.A., Lausanne, Switzerland

Filed Aug. 24, 1976, Ser. No. 717,188
Claims priority, application Sweden, Aug. 26, 1975, 75094623
Int. Cl.[2] B05D 3/12
U.S. Cl. 427—209 9 Claims



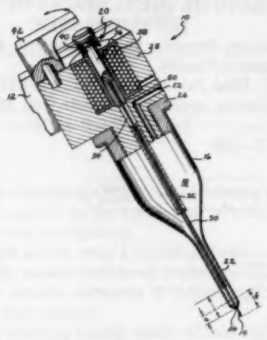
1. A method of coating at least one face of a moving web such as a paper web, comprising feeding the web longitudinally at a speed in excess of 400 meters per minute, between a movable support and a blade, which together form a nip, the blade having a bevel at the point of contact with the web, applying an excess of coating material on one side of the web in the nip, the coating material having a dryness content exceeding 60% and/or a viscosity exceeding 1500 c.p., controlling the angle of the blade, so that it extends at an angle of at most 20° to the web and choosing the bevel width, measured in the direction of movement of the web, to be at most 0.05 centimeters, said blade being urged against the web with a force not exceeding 2 kgf per centimeter width of web.

4,133,918

METHOD OF MARKING SEMICONDUCTORS

Douglas P. Simms, Sunnyvale; Anthony F. White, Cupertino, and Carl W. Miller, Santa Clara, all of Calif., assignors to The Computervision Corporation, Bedford, Mass.

Filed May 16, 1977, Ser. No. 797,738
Int. Cl.[2] B65D 47/18; B05D 5/00
U.S. Cl. 427—256 4 Claims



1. A method for operating a marking device having a marking fluid dispensing filament that is driven by a solenoid through a marking fluid reservoir orifice to propel a small amount of marking fluid to a workpiece, said method comprising the steps of:

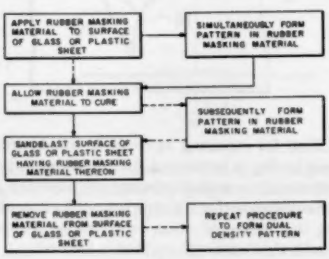
1. applying an energizing electrical current at a first current level to the coil of the solenoid for a predetermined time, whereby the dispensing filament breaks the marking fluid meniscus and propels the marking fluid to the workpiece; thereafter,
2. reducing the current level of the energizing electrical current to a second and lower level for another predetermined time; and, finally,
3. terminating the application of the energizing electrical current to the solenoid coil.

4,133,919

METHOD OF MAKING DECORATIVE PANELS

Robert C. Parsons, 8003 Inwood Rd., Dallas, Tex. 75209

Division of Ser. No. 677,363, Apr. 15, 1976, Pat. No. 4,093,754.
This application Oct. 12, 1977, Ser. No. 841,454
Int. Cl.[2] B05D 5/00
U.S. Cl. 427—259 3 Claims


APPLY RUBBER MASKING MATERIAL TO SURFACE OF GLASS OR PLASTIC SHEET
SIMULTANEOUSLY FORM PATTERN IN RUBBER MASKING MATERIAL
ALLOW RUBBER MASKING MATERIAL TO CURE
SUBSEQUENTLY FORM PATTERN IN RUBBER MASKING MATERIAL
SANDBLAST SURFACE OF GLASS OR PLASTIC SHEET HAVING RUBBER MASKING MATERIAL THEREON
REMOVE RUBBER MASKING MATERIAL FROM SURFACE OF GLASS OR PLASTIC SHEET
REPEAT PROCEDURE TO FORM DUAL DENSITY PATTERN

1. A method of making decorative panels comprising:

forming a predetermined pattern in a screen by covering the

screen with a photosensitive emulsion, exposing the photosensitive emulsion photographically and developing the exposed photosensitive emulsion such that a portion of the screen corresponding to the image of the photograph will permit the passage of liquid therethrough;

positioning the screen adjacent a panel with the pattern in the screen adjacent a surface of the panel;

applying liquid elastomeric masking material to the surface of the panel through the screen and thereby applying the liquid elastomeric material to the surface of the panel in accordance with the pattern on the screen;

curing the liquid elastomeric masking material on the surface of the panel and thereby forming a substantially solid masking layer on the surface of the panel in accordance with the predetermined pattern;

impinging a high velocity stream of particulate material onto the surface of the panel having the masking layer thereon and thereby visually differentiating the unmasked portion of the surface of the panel from the masked portions thereof; and

subsequently removing the masking layer to provide a panel having visually differentiated areas corresponding to the previously masked and the previously unmasked portions of the surface of the panel.

4,133,920

METHOD FOR REINFORCING THE EDGE REGION OF A PLATE FORMED OF A POROUS MATERIAL BY MEANS OF A REINFORCEMENT AGENT

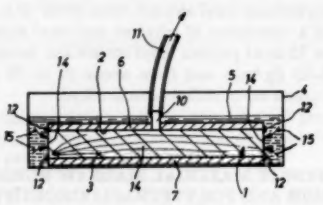
Hans Schulthess, Klingnau, Switzerland, assignor to Keller & C. Aktiengesellschaft, Klingnau, Switzerland

Filed Mar. 2, 1976, Ser. No. 663,199

Claims priority, application Switzerland, Mar. 7, 1975, 2948/75

Int. Cl.² B05D *1/32*

U.S. Cl. 427—282 **5 Claims**



1. A method of reinforcing an edge region of a porous plate by impregnating said edge region with a reinforcement agent, comprising the steps of:

(1) providing a porous plate having plate surfaces and a peripheral plate edge;

(2) providing a reinforcement agent-bath;

(3) covering each said plate surface completely with a covering plate, prior to immersion of the plate into the bath in order to protect the covered plate surfaces against contact with the reinforcement agent, and to seal against the entry of the reinforcement agent at the edge of each covering the intermediate space between the covering plate and the neighboring plate surface, the space between at least one covering plate and the associated plate surface being connected to an air suction means;

(4) completely immersing the plate into the bath containing the reinforcement agent;

(5) withdrawing air contained within the pores of the plate by applying vacuum from said space between said at least one covering plate and the associated plate surface, said reinforcement agent thereby penetrating and reinforcing said edge region along substantially the entire periphery thereof in a single operation.

4,133,921

RUBBER AND POLYMER PRESERVATIVE METHOD

Joseph J. Palcher, Santa Ana, Calif., assignor to Very Important Products, Inc., Newport Beach, Calif.

Continuation of Ser. No. 496,395, Aug. 12, 1974, abandoned, which is a division of Ser. No. 434,981, Jan. 21, 1974, Pat. No. 3,956,174, which is a continuation of Ser. No. 251,162, May 8, 1972, abandoned, which is a continuation of Ser. No. 193,984, Oct. 29, 1971, abandoned. This application Nov. 26, 1976, Ser. No. 745,190

Int. Cl.² C09G *1/16*

U.S. Cl. 427—355 **2 Claims**

1. A process for preserving and renewing the surface of a solid consisting essentially of:

selecting a preservative composition consisting essentially of an emulsion of at least one emulsifiable organopolysiloxane fluid and based on the weight of the organopolysiloxane fluid, from about 65 percent to about 660 percent by weight of water, and from about 0.5 percent to about 10 percent by weight of diethylene glycol and from about 60 percent to about 10 percent by weight of glycerin;

thoroughly wetting the surface of said solid with said preservative composition;

allowing said composition to penetrate said surface and dry for an initial drying period of approximately an hour;

lightly rubbing said surface after said initial drying period;

allowing said composition to penetrate said surface and dry for a total period of at least about 24 hours;

lightly buffing said surface after said total period;

thoroughly wetting the surface of said solid again with said preservative composition;

allowing said composition to penetrate said surface and dry for a second initial drying period of approximately one hour;

lightly rubbing said surface after said second initial drying period;

allowing said composition to penetrate said surface and dry for a second total period of at least about 24 hours; and

lightly buffing said surface after said second total period.

4,133,922

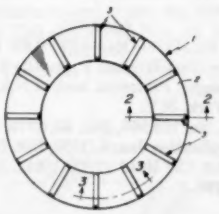
WREATH DEVICE

Joseph Smith, 472 N. Quincy St., Brockton, Mass. 02402

Filed May 27, 1977, Ser. No. 801,058

Int. Cl.² A47G *33/00*

U.S. Cl. 428—10 **3 Claims**



1. A decorative wreath-type ornamentation component comprising an annular member with a flat planar-like surface, a plurality of radially arranged retaining members each formed with a pair of legs with one extending angularly from each end of an interconnecting bight, the ends of said legs remote from said bight engaging the outer periphery of said surface said bights extending generally radially from the center of said annular member, and spaced along their center lengths from said surface and means forming a plurality of radially arranged openings in said member intermediate said legs said retaining members adapted to retain the ends of sprigs of fir trees with the other ends overlying the bights of adjacent retaining members.

4,133,923

COATED BOTTLES

Harry W. Blunt, Hockessin, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 711,340, Aug. 4, 1976, abandoned. This application Oct. 26, 1977, Ser. No. 845,511
Int. Cl.[2] B65D 11/16
U.S. Cl. 428—35 5 Claims

1. A glass container having as a surface coating an alloy consisting essentially of an elastomeric blend of propylene polymer having an intrinsic viscosity of about 2.2 to 3.0 and 15 to 40% by weight based on the weight of the total blend of a hydrocarbon elastomer selected from the class consisting of

(a) polyisobutylene rubber; and

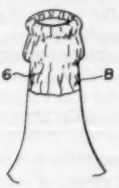
(b) ethylene-propylene copolymer rubbers; said blend having a good high rate elongation and energy absorption characteristics at room temperature.

4,133,924

HEAT SHRINKABLE LAMINATE FILM

Koichi Seino, Chigasaki; Hiroshi Omura, Hiratsuka; Takayuki Hinuma, Chigasaki, and Jyuzo Hirota, Hiratsuka, all of Japan, assignors to Mitsubishi Plastics Industries Limited, Tokyo, Japan

Filed Sep. 14, 1977, Ser. No. 833,069
Claims priority, application Japan, Mar. 16, 1977, 52/29099
Int. Cl.[2] B32B 15/08, 27/30, 27/36
U.S. Cl. 428—164 20 Claims



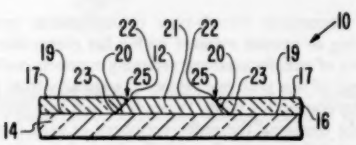
1. A heat shrinkable laminate film which comprises a heat shrinkable synthetic resin film and a low shrink film which forms creases or crepes when said laminate is heat shrunk, and which is lamimated on the heat shrinkable film with an adhesive composition having low cohesive force and high melt flowability and an adhesive strength lower than the shrinking force of the heat shrinkable film.

4,133,925

PLANAR SILICON-ON-SAPPHIRE COMPOSITE

Joseph M. Shaw, East Windsor Township, Mercer County, and Karl H. Zaininger, Princeton, both of N.J., assignors to RCA Corp., New York, N.Y.

Division of Ser. No. 755,966, Dec. 30, 1976, Pat. No. 4,076,573.
This application Jan. 6, 1978, Ser. No. 867,618
Int. Cl.[2] B01J 17/00; H01L 23/00
U.S. Cl. 428—195 4 Claims



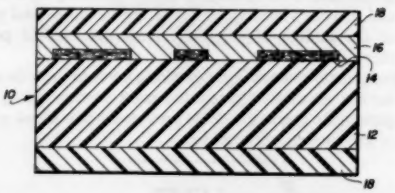
1. A composite comprising an epitaxially grown silicon island having at least one sidewall transverse to a major surface of said island, a monocrystalline aluminum oxide substrate supporting said island, and a layer of monocrystalline aluminum oxide adjacent to said substrate, said layer having a surface substantially coplanar with said major surface of said island, said layer surrounding said island in contiguous contact with said sidewall, whereby an interface between the island and the substrate is covered.

4,133,926

LAMINATED IDENTIFICATION CARD HAVING SPECIAL INTERLAMINAR ADHESIVE

Robert J. Vorrier, Palos Hills, and Vitas Niaura, Western Springs, both of Ill., assignors to American Hoechst Corporation, Somerville, N.J.

Filed Jul. 5, 1977, Ser. No. 812,705
Int. Cl.[2] B32B 3/00
U.S. Cl. 428—200 17 Claims



1. In a laminate article comprising a vinyl sheet having a surface at least a portion of which is printed with a compatible printing ink, a generally transparent vinyl film laminated to the sheet and an adhesive composition interposed between the film and at least the printed portion of the sheet, the improvement wherein the adhesive composition contains the dry residue on a solids basis of from about 25 to 75 parts by weight of a vinyl terpolymer which contains about 84 to 96 weight percent of interpolymerized vinyl chloride, about 2 to 6 weight percent of interpolymerized vinyl acetate and about 2 to 10 weight percent interpolymerized vinyl alcohol; from about 10 to 50 parts by weight of a copolymer of ethylene and vinyl acetate containing about 35 to 45 percent vinyl acetate and having a melt index of 45–65 dg/min. and from about 10 to 50 parts by weight of a castor oil-modified sebacic alkyd.

4,133,927

COMPOSITE MATERIAL MADE OF RUBBER ELASTOMER AND POLYTETRAFLUOROETHYLENE RESIN

Masayasu Tomoda, Takatsuki, and Yutaka Ueta, Ibaraki, both of Japan, assignors to Kaikin Kogyo Co., Ltd., Osaka, Japan

Filed Oct. 18, 1976, Ser. No. 733,124
Claims priority, application Japan, Oct. 23, 1975, 50/127940
Int. Cl.[2] B32B 27/04, 7/10, 7/00
U.S. Cl. 428—215 11 Claims

1. A composite material comprising a vulcanized rubber elastomer substrate laminated with a porous film or sheet of polytetrafluoroethylene resin wherein said porous resin film or sheet forms a layer having a thickness of between 0.05 mm and 5 mm on the surface of the elastomer substrate, said porous resin surface layer having a porosity of between 20 and 95% by volume, the pores of which are at least partially filled with vulcanized rubber elastomer, said composite material being obtained by superimposing said porous resin film or sheet on a vulcanizable rubber elastomer substrate and subjecting said superimposed elastomer substrate to heat and pressure sufficient to effect vulcanization of the rubber elastomer substrate and adhesion between the porous resin film or sheet and the elastomer substrate.

5. The composite material according to claim 1 wherein the entire external surface of said substrate is laminated with said porous film or sheet.

4,133,928
FIBER REINFORCING COMPOSITES COMPRISING PORTLAND CEMENT HAVING EMBEDDED THEREIN PRECOMBINED ABSORBENT AND REINFORCING FIBERS

Victor Riley; Ian Macnab; John Timusk, all of Toronto, Canada, and Edward English, Downey, Calif., assignors to The Governing Council of the University of Toronto, Toronto, Canada

Continuation of Ser. No. 586,140, Jun. 11, 1975, Pat. No. 4,076,884, which is a division of Ser. No. 343,863, Mar. 22, 1973, Pat. No. 3,903,879. This application Aug. 29, 1977, Ser. No. 828,921

Claims priority, application United Kingdom, Mar. 22, 1972, 13333/72

Int. Cl.² B32B 7/00

U.S. Cl. 428—255 **7 Claims**

1. Fibre reinforced composite comprising a portland cementitious matrix material having embedded therein precombined absorbent fibres and reinforcing fibres, said absorbent fibres being selected from the group consisting of cotton, wool, cellulose, viscose rayon and cuprammonium rayon, and the reinforcing fibres being selected from the group consisting of glass, steel, carbon, polyethylene and polypropylene.

4,133,929
IONICALLY MODIFIED CELLULOSE MATERIALS FOR REMOVAL OF HEAVY METAL IONS

Quentin Bowes, Rheinfelden; Jaroslav Haase, Riehen, and Rudolf F. Wurster, Pfeffingen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 14, 1977, Ser. No. 806,574

Claims priority, application Switzerland, Jun. 24, 1976, 8087/76

Int. Cl.² B32B 7/10; B05D 3/04, 3/10

U.S. Cl. 428—260 **10 Claims**

1. A cellulosic adsorption material for the removal of heavy metal ions which contains at least one chelate-forming amino acid group which is bonded through the group of the formula

$$-O-CH_2-\underset{|}{N}-CO- \quad (1)$$

to the cellulose portion, wherein the carbonyl group is linked to the chelate-forming radical and the oxygen is linked to the cellulose portion.

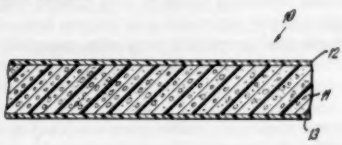
4,133,930
LIGHTWEIGHT STRUCTURAL PANEL

John T. Wright, Cattaraugus, and Kevin A. Wolfe, Otto, both of N.Y., assignors to Champion International Corporation, Stamford, Conn.

Filed Nov. 17, 1977, Ser. No. 852,383

Int. Cl.² B32B 5/18

U.S. Cl. 428—315 **11 Claims**



9. A three layered lightweight structural panel comprising a central styrene foam core member; first and second pigmented polyethylene cover sheets, each of said cover sheets having substantially the same plan configuration as said core member, each of said cover sheets being structurally bonded to one of the faces of said core member, said cover sheets and said core member having substantially the same response to changes in temperature and humidity such that the panel retains its shape despite constant exposure to changes in temperature and humidity, said cover sheets further containing a mixture of phenolic wood flour fillers, light inhibitors, sterically hindered phenols, trifunctional phenols, sterically hindered amines and metallic pigments for rendering said panel substantially weatherproof.

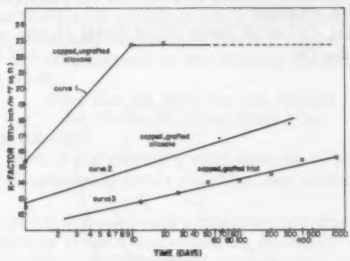
4,133,931
CLOSED CELL PHENOLIC FOAM

John H. Beale, and Ernest K. Moss, both of St. Petersburg, Fla., assignors to The Celotex Corporation, Tampa, Fla.

Continuation of Ser. No. 688,066, Mar. 18, 1976. This application Apr. 12, 1978, Ser. No. 895,752

Int. Cl.² B32B 3/26

U.S. Cl. 428—315 **22 Claims**



1. A laminated structural panel having at least one facing sheet and having adhered to it a closed cell foam material comprising the reaction product of:

A. phenolic resin,

B. a blowing agent,

C. a surfactant characterized in that it is branched, non ionic, has a hydroxyl value less than 50 and its hydroxyl groups which would otherwise give the surfactant a higher hydroxyl value are capped.

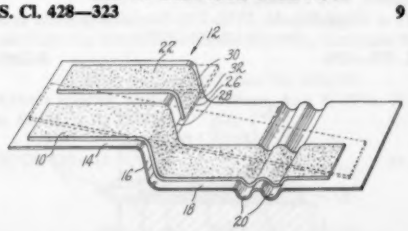
4,133,932
SOUND DEADENER SHEET

Sumner H. Peck, Wakefield, Mass., assignor to USM Corporation, Farmington, Conn.

Continuation of Ser. No. 748,201, Dec. 7, 1976, abandoned, which is a continuation-in-part of Ser. No. 697,575, Jun. 18, 1976, abandoned. This application Nov. 22, 1977, Ser. No. 853,844

Int. Cl.² B32B 5/16; G10K 11/00

U.S. Cl. 428—323 **9 Claims**



1. A sound deadener sheet softenable by heat to wilt into conformity and adhesive engagement with a contoured metal surface but resistant to running and flow at higher temperatures, said sheet being formed of a mixture of mineral filler and a binder, said binder comprising about 45% to about 70% by weight of asphaltic bitumen from the class consisting of natural asphalt and residue from the distillation of petroleum, from about 5% to about 20% by weight of an elastomeric modifier

compatible with said asphaltic bitumen and from about 1.5% to about 3.5% of the solid, non-thermoplastic product of reaction of vegetable unsaturated oil with sulfur, sulfur monochloride or sulfur dichloride coacting with the asphaltic bitumen to prevent running and flow of said sheet at higher temperatures, said weight percentages being based on the weight of said binder.

4,133,933

ELECTROSENSITIVE RECORDING SHEET WITH SUPPORT CONTAINING CUPROUS IODIDE PARTICLES

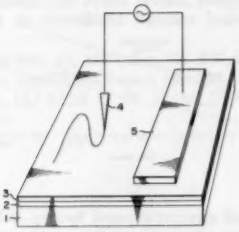
Yoichi Sekine; Wataru Shimotsuma, both of Hirakata, and Shigeru Tsubusaki, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 22, 1976, Ser. No. 698,361

Claims priority, application Japan, Jun. 27, 1975, 50-80459; Jun. 27, 1975, 50-80460

Int. Cl.[2] B32B *29/04, 27/14;* G01D *15/34*

U.S. Cl. 428—328 **27 Claims**



1. An electrosensitive recording sheet having, on a support of paper or plastic film, an electroconductive layer which contains cuprous iodide particles having an excess amount of iodine, wherein the cuprous iodide particles have been whitened by removing iodine existing on the surface of the cuprous iodide particles using an aqueous alkaline material.

15. A method for whitening cuprous iodide particles having an excess amount of iodine which comprises adding an alkaline material to an aqueous dispersion of cuprous iodide particles to remove iodine existing on the surface of the cuprous iodide particles.

4,133,934

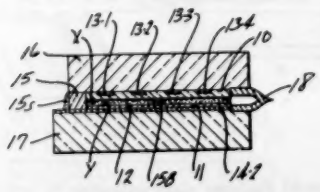
ARTICLE COMPRISING DIELECTRIC BODY

Michael E. Fein; Bernard W. Byrum, Jr., both of Toledo, and Roger E. Ernsthausen, Luckey, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 16, 1973, Ser. No. 333,093

Int. Cl.[2] B32B *9/04*

U.S. Cl. 428—336 **2 Claims**



1. An article of manufacture comprising a dielectric body having a structural configuration for use in a gaseous discharge display/memory device, the dielectric body having at least one electrode member on one side thereof and on the opposite side thereof having a deposit of a source of at least one element selected from the group consisting of selenium, tellurium, and polonium, said deposit having a thickness of at least 100 angstrom units.

4,133,935

COATED ELECTRODES FOR UNDERWATER METAL WORKING

Thomas J. Dawson, Falls Church, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 17, 1977, Ser. No. 852,382

Int. Cl.[2] D02G *3/00;* B32B *27/32*

U.S. Cl. 428—379 **8 Claims**

1. A waterproofed electrode suitable for wet metal-working which comprises an electrode and a coating comprising from 0.25 to 0.80 cm of a thermally degradable material having a dielectric strength of at least 300 volt/mil, and a water absorption power of not greater than 0.10 weight percent/48 hours; said coating is produced by the method comprising encasing said electrode in a heat-shrinkable tubing of a polyolefin selected from the class consisting of polyethylene, polypropylene, polybutylene, and mixtures thereof and heating said electrode at a temperature not exceeding 90% of the melting point in degrees centigrade of said tubing until said tubing has tightly sealed said electrode.

4,133,936

HEAT RESISTANT ETHYLENE-PROPYLENE RUBBER AND INSULATED CONDUCTOR PRODUCT THEREOF

Joseph E. Vostovich, Bridgeport, Conn., assignor to General Electric Company, New York, N.Y.

Division of Ser. No. 576,555, May 12, 1975, Pat. No. 4,069,190. This application Nov. 4, 1977, Ser. No. 848,460

Int. Cl.[2] B32B *9/00, 15/00;* C03K *3/04*

U.S. Cl. 428—389 **4 Claims**

1. An electrical conductor insulated with a cured ethylene-propylene rubber having improved resistance to heat and apt electrical and physical properties, consisting essentially of a metal conductor having thereon an insulating composition of the crosslink cured product, in approximate parts by weight, of:

Ethylene-propylene rubber	100
Chlorosulfonated polyethylene	3 - 10
Zinc Oxide	15 - 30
Talc	75 - 200
Vinyl silane	1- 3
Carbon black	10 - 30
Antimony oxide	0 - 10
Antioxidant	0.5 - 6
Peroxide curing agent	2 - 8
Curing Coagent	0 - 3

4,133,937

FIBERS COATED WITH TRIOZINE POLYMERS

Gordon H. Miller, Littleton, Colo., assignor to Texaco Inc., New York, N.Y.

Division of Ser. No. 621,702, Oct. 14, 1975, Pat. No. 4,100,147. This application Sep. 7, 1977, Ser. No. 831,214
Int. Cl.[2] B32B *9/00, 23/00;* D02G *3/00*
U.S. Cl. 428—392 3 Claims

1. Glass fiber coated with a soluble curable triazine polymer formed in a process which comprises

(A) preparing a B-stage triazine polymer by heating an aliphatic polynitrile having the formula

wherein n is an integer of from 1 to 8 inclusive and in each

R and R′ are independently selected from the group consisting of hydrogen, alkyl of from 1 to 10 inclusive carbon atoms, amino, nitro, hydroxyl, carboxyl and halogen, at a temperature of about 80° to about 450° C. in the presence of a catalyst selected from the group consisting of:

(a) phosphorus pentoxide, phosphorus trichloride, phosphorous pentachloride, arsenic trichloride, and arsenic pentachloride;

(b) hydrochloric acid, hydrofluoric acid, fluosulfonic acid, chlorosulfonic acid; and

(c) halides of metals of Groups II, III, IV, V and VIII of the Periodic Table,

(B) contacting the said B-stage polymer with a solvent of the formula:

$$R - O - R';$$

where R and R′ are independently selected alkyl groups from 1 to 5 carbon atoms in order to extract therefrom the unreacted polynitrile;

(C) extracting the soluble, curable triazine polymer as an alcoholic solution by contacting the thus-treated B-stage polymer with a monohydric alcohol, and

(D) recovering the soluble, curable triazine polymer from said alcohol solution.

4,133,938

PRIMER COMPOSITIONS FOR SILICONE ELASTOMERS

Thomas G. Bingham, Tecumseh, Mich., assignor to SWS Silicones Corporation, Adrian, Mich.

Continuation of Ser. No. 619,081, Oct. 2, 1975, abandoned. This application Apr. 15, 1977, Ser. No. 790,219
Int. Cl.[2] B32B *13/04;* C09J *5/04*
U.S. Cl. 428—447 15 Claims

1. A method for bonding a room temperature vulcanizable organopolysiloxane composition to a porous masonry substrate which bonded composite will be in contact with water which comprises applying to the masonry substrate a solution consisting essentially of a product obtained from the reaction of an acrylate and an acryloxyalkylalkoxysilane in the presence of a free radical initiator and an organic solvent, evaporating off the solvent and thereafter applying a room temperature vulcanizable modified organopolysiloxane composition to the dried substrate, said room temperature vulcanizable modified organopolysiloxane composition is obtained from the polymerization of an organopolysiloxane of the formula

in which R′′′′ is selected from the class consisting of monovalent hydrocarbon radicals, halogenated monovalent hydrocarbon radicals having from 1 to 18 carbon atoms and a cyanoalkyl radical and x is a number of from 0 to 20,000, with a polymerizable organic monomer having aliphatic unsaturation in the presence of a free radical initiator and thereafter adding a cross-linking agent to the modified organopolysiloxane.

4,133,939

METHOD FOR APPLYING A SILICONE RELEASE COATING AND COATED ARTICLE THEREFROM

Gary N. Bokerman, Midland, and David J. Gordon, Essexville, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 16, 1977, Ser. No. 861,134
Int. Cl.[2] B32B *21/04;* B05D *3/06*
U.S. Cl. 428—447 7 Claims

1. A method for treating a solid substrate to improve the release of adhesive materials therefrom, said method comprising

(I) applying to the substrate a radiation-curable polydiorganosiloxane composition consisting essentially of a triorganosiloxane-endblocked polydiorganosiloxane fluid having a viscosity of at least 0.5 pascal-seconds at 25° C., wherein from 50 to 99 percent of all organic radicals are methyl radicals from 1 to 5 percent of all organic radicals are mercaptoalkyl radicals having the formula $-(CH_2)_nSH$, wherein n has a value of from 1 to 4 inclusive, there being an average of at least 3 mercaptoalkyl radicals per molecule, any remaining organic radicals being phenyl radicals or alkyl radicals having from 2 to 6, inclusive, carbon atoms,

(II) exposing the applied composition to energetic radiation, thereby curing the applied composition, and

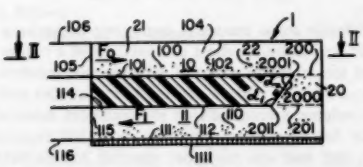
(III) recovering an article comprising the substrate having adhered thereto a cured polydiorganosiloxane that will provide premium release of aggressive adhesives therefrom.

4,133,940

ELECTROCHEMICAL GENERATORS HAVING TWO SEDIMENTATION-BED CHAMBERS FED IN SERIES WITH AN ELECTROLYTE WHICH CONTAINS PARTICLES

Pierre Durand, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Aug. 4, 1977, Ser. No. 821,761
Claims priority, application France, Aug. 8, 1976, 76 24467; Jul. 19, 1977, 76 22331
Int. Cl.[2] H01M *8/04*
U.S. Cl. 429—12 33 Claims



1. A method of producing electric current utilizing electrochemical reactions in a generator comprising at least two

chambers and a connecting conduit connecting the two chambers in series so that one of the chambers is upstream and the other downstream of the conduit, each of the two chambers comprising two main faces, said method comprising the steps of creating, through the two chambers, a flow in series of a liquid electrolyte which contains a plurality of particles, at least one of the two chambers constituting a compartment comprising at least one electron collector, characterized in that the flow passes from the upstream chamber to the downstream chamber via the connecting conduit, the connecting conduit being formed with two openings which respectively debouch on the closest main faces of the two chambers, each opening being limited by an edge on the side of the adjacent main face, so that the streamlines of the flow in the vicinity of each of these edges are oriented substantially at right angles to said respective edges.

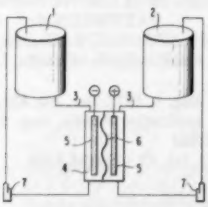
6. An electrochemical generator of electric current comprising at least two chambers, and a connecting conduit connecting the two chambers in series, each of the two chambers comprising two main faces and two sides faces connected by at least one end face, the side faces being connected to the main faces by side connecting lines, the end face being connected to the main faces by end connecting lines, the generator comprising means for creating, through the two chambers, a flow in series of a liquid electrolyte which contains a plurality of particles, at least one of the two chambers constituting a compartment comprising at least one electron collector, characterized in that the connecting conduit is formed with two openings which respectively debouch on the closest main faces of the two chambers, each opening being limited by an edge on the side of the adjacent main face so that the streamlines of the flow in the vicinity of each of these edges are oriented substantially at right angles to said respective edges.

4,133,941

FORMULATED PLASTIC SEPARATORS FOR SOLUBLE ELECTRODE CELLS

Dean W. Sheibley, Sandusky, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 10, 1977, Ser. No. 776,146
Int. Cl.[2] H01M *8/18*
U.S. Cl. 429—33 **18 Claims**



1. A chloride anion transport membrane comprising a hydrochloric acid-insoluble sheet of a mixture of a rubber and a powdered ion transport material wherein said mixture comprises about 50 to 80 volume percent of said rubber and about 50 to 20 volume percent of said ion transport material, said sheet only has micropores less than about 100 angstroms in diameter, and said ion transport material has particle sizes ranging from about 0.01 to 10 microns, said ion transport material being a salt of a chloride anion and a phosphonium, tertiary ammonium or quaternary ammonium cation.

4,133,942

POLYMERIC CARRIER FOR A CONTROLLED SYNTHESIS OF PEPTIDES AND THE METHOD OF ITS PREPARATION

Jiri Coupek, Praha, and Vladimir Gut, Uhrineves, both of Czechoslovakia, assignors to Ceskoslovenska akademie ved, Praha, Czechoslovakia

Division of Ser. No. 549,830, Feb. 13, 1975, Pat. No. 4,079,021, which is a division of Ser. No. 413,390, Nov. 6, 1973, Pat. No. 3,925,267. This application Nov. 30, 1977, Ser. No. 856,083
Claims priority, application Czechoslovakia, Nov. 6, 1972, 747572/72
Int. Cl.[2] C08J *9/00*; C08G *12/08*
U.S. Cl. 521—147 **1 Claim**

1. A polymeric gel carrier having a macroporous structure for use in the controlled synthesis of polypeptides, comprising a diazotized terpolymer of a first monomer selected from the group consisting of hydroxyalkyl acrylates, hydroxyalkyl methacrylates, aminoalkyl acrylates and aminoalkyl methacrylates, a polyfunctional cross-linking monomer selected from the group consisting of alkylene diacrylates, alkylene dimethacrylates and polyacrylates and polymethacrylates of polyalcohols and a third monomer which contains an aromatic ring selected from the group consisting of phenyl acrylate, phenyl methacylate, phenoxyalkyl acrylates and phenoxyalkyl methacrylates, at least one of said monomers being an amino-containing monomer, said latter terpolymer being coupled with a passive aromatic component selected from the group consisting of phenolic compounds and thereafter having the aromatic rings thereof chloromethylated.

4,133,943

PROCESS FOR THE PRODUCTION OF POLYURETHANE ELASTOMERS AND FOAMS

Johannes Blahak, Cologne; Kuno Wagner, Leverkusen; Jan Mazánek, Cologne, and Peter Haas, Haan, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 24, 1978, Ser. No. 899,431
Claims priority, application Fed. Rep. of Germany, May 5, 1977, 2720166
Int. Cl.[2] C08G *18/10, 18/14, 18/32*
U.S. Cl. 521—163 **8 Claims**

1. In a process for the production of cellular or non-cellular polyurethane urea elastomers comprising reacting:

(a) organic polyisocyanates;

(b) organic compounds having molecular weights of from 400 to 10,000 and containing at least two Zerewitinoff active hydrogen atoms; and

(c) aromatic diamines as chain extending agents;

the improvement wherein compound (c) comprises a quantity of from 2 to 50 mol percent, based on the total molar quantity of (c), of (c_1) aromatic diamines having at least one carboxylic or sulphonic acid group in a form selected from the group consisting of metal salts, substituted ammonium salts or unsubstituted ammonium salts and 98 to 50 mol percent of (c_2) aromatic diamines containing at least one carboxylic acid ester or sulphonic acid ester group.

4,133,944

ETHYLENE POLYMERIZATION

Richard R. Cooper, Saint Albans, and Kenneth S. Whiteley, Welwyn Garden City, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 456,382, Mar. 29, 1974, abandoned. This application Nov. 25, 1975, Ser. No. 635,265
Claims priority, application United Kingdom, Mar. 29, 1973, 15158/73
The portion of the term of this patent subsequent to Mar. 29, 1995, has been disclaimed.
Int. Cl.[2] C08F *10/02, 10/08, 10/14*
U.S. Cl. 526—65 **12 Claims**

1. A process for the homopolymerisation of ethylene which

comprises introducing a mixture of from 20 to 80% by weight of a volatile inert diluent and correspondingly from 80 to 20% by weight of ethylene into a polymerisation reactor and in the polymerisation reactor the mixture is contacted with a transition metal polymerisation catalyst at a temperature of from 100° C. up to 350° C. and a pressure of from 300 up to 1000 kgm/cm^2.

11. A process for the copolymerisation of ethylene which comprises introducing a mixture of from 20 up to 95% by weight of at least one 1-olefine monomer and correspondingly from 80 to 5% by weight of ethylene into a polymerisation reactor in which the mixture is contacted with a transition metal polymerisation catalyst at a temperature of from 100° C. up to 350° C. and a pressure of from 300 up to 1000 kgm/cm^2 and in order to replace the ethylene and comonomer which have been polymerised a feed of fresh ethylene is provided and at least a part of this feed is subjected to a dimerisation step which is effected in the polymerisation reactor.

4,133,945

PROCESS FOR THE PREPARATION OF CYCLIZED POLYDIENES

Giuseppe Stigliani, Busto Arsizio (Varese); Alessandro Giudici, Castellanza (Varese), and Franco Ferré, Gorla Minore (Varese), all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Jan. 17, 1978, Ser. No. 870,147

Claims priority, application Italy, Jan. 17, 1977, 19352 A/77

Int. Cl.^{2} C08F *4/52*

U.S. Cl. 526—189 **17 Claims**

1. A process for the preparation of cyclized polydienes devoid of crosslinked fractions, which comprises polymerizing one or more conjugated diolefins in solution in a solvent consisting of a mixture of one or more saturated aliphatic or cycloaliphatic hydrocarbons with one or more chlorinated saturated aliphatic or cycloaliphatic hydrocarbons, said chlorinated hydrocarbons being present in said solvent in an amount of from 20 to 95% by weight, in the presence of from 0.1 to 10 moles for each 100 moles of diolefins, of a catalyst of the formula $R_n Al Cl_{3-n}$, where R is an alkyl radical with from 1 to 6 carbon atoms and n is from 1 to 1.5, interrupting the polymerization before the critical conversion, corresponding to the beginning of the formation of crosslinked fractions, is reached, and recovering the cyclized polydienes thus obtained from the reaction medium.

4,133,946

OPTICALLY ACTIVE POLYMERIC METHYLPINANE DERIVATIVES CONTAINING UREIDO GROUPS

Hardo Siegel, Speyer, and Herbert Naarmann, Wattenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

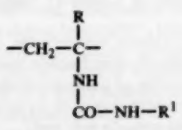
Filed Mar. 20, 1978, Ser. No. 888,402

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1977, 2717500

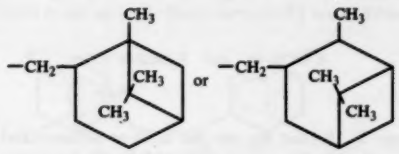
Int. Cl.^{2} C08F *32/08*

U.S. Cl. 526—282 **1 Claim**

1. A polymer, having a K value of from 20 to 140, which comprises structural units of the general formula



where R is H or CH_3 and R^1 is



4,133,947

PROCESS FOR PRODUCTION OF POLYMERS OF VINYL CHLORIDE FOR PASTE PREPARATION USING SPRAY-DRYING

Josef Kalka, Herten; Hermann Winter, and Alfred Kania, both of Marl, all of Fed. Rep. of Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 7, 1976, Ser. No. 703,232

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1975, 2531780

Int. Cl.^{2} C08F *6/14, 2/26, 14/06*

U.S. Cl. 528—502 **8 Claims**

1. A process for the production of powdery polymers of vinyl chloride having improved plastisol properties and containing no more than 2% by weight of particles having a diameter greater than 40 microns, which comprises spray drying the polymer dispersion obtained by the aqueous emulsion polymerization of an emulsion containing at least 45% by weight of monomers, in the presence of a sodium or potassium salt of a fatty acid of 8–18 carbon atoms as the emulsifier and a water-soluble free radical generating catalyst to a conversion of at least 80%, the polymerization being conducted either

(a) discontinuously in a reactor having a capacity of at least 6 m^3 and in the presence of no more than 1% by weight of emulsifier, based on the polyvinyl chloride, with at least the portion of the polymerization above a conversion of 30% being conducted in a pH range of 9.5–11.5; or

(b) continuously in the presence of no more than 2% by weight of emulsifier, based on the polyvinyl chloride, in a pH range throughout the polymerization of 9.5–11.5; and which comprises the step of adjusting the pH of the resultant polymer dispersion to a pH of 6–7.5 before the spray-drying step or to a pH of 4–7.5 during the spray-drying step to produce said powdery polymers of vinyl chloride having improved plastisol properties and containing no more than 2% by weight of particles having a diameter greater than 40 microns.

4,133,948

MONOSACCHARIDES AND PRODUCTS RESULTING THEREFROM

Gerhardus J. Lourens, Randburg; Johannes M. Koekemoer, Pretoria, and Elise M. M. Venter, Johannesburg, all of South Africa, assignors to Chembro Holdings (Proprietary) Limited, Johannesburg, South Africa

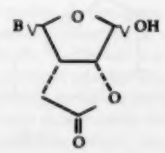
Continuation-in-part of Ser. No. 565,134, Apr. 4, 1975, abandoned. This application Apr. 8, 1976, Ser. No. 674,874

Claims priority, application South Africa, Jan. 16, 1975, 75/0317

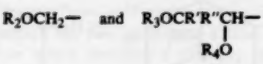
Int. Cl.^{2} C07H *3/02, 9/02*

U.S. Cl. 536—1 **17 Claims**

1. A compound of the formula:



wherein B may be α or β and represents a hydrocarbyl group selected from:



wherein R_2, R_3 and R_4, are the same or different and each represents a blocking group selected from alkyl groups of 1 to 4 carbon atoms which may be substituted with one or more phenyl groups and acyl groups of the formula R'''CO- wherein R''' is an alkyl group of 1 to 4 carbon atoms or a phenyl group, or R_3 and R_4 together are > C=O and R' and R'', the same or different, each represents a hydrogen or a lower alkyl group of 1 to 4 carbon atoms which may be substituted by a hydroxy group or hydroxy group blocked by a blocking group as defined above.

4,133,949

DICARBOXYLIC ACID ESTERS OF CARDIAC GLYCOSIDES

Hans-Georg Batz, Tutzing; Hans-Ralf Linke, Wielenbach; Klaus Stellner, Bernried, and Günter Weimann, Tutzing, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Germany

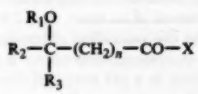
Filed Aug. 16, 1976, Ser. No. 715,020

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1975, 2537129

Int. Cl.[2] C07J *19/00*

U.S. Cl. 536—7 **4 Claims**

1. Reactive asymmetrical dicarboxylic acid esters of the general formula



(I)

wherein

R_1 is a digoxin or digitoxin residue,

R_2 and R_3 together represent an oxygen atom,

X is succinimido-N-oxy, and

n is 2,3,4 or 5.

4,133,950

4''-DEOXY-4''-CARBAMATE AND DITHIOCARBAMATE DERIVATIVES OF OLEANDOMYCIN AND ITS ESTERS

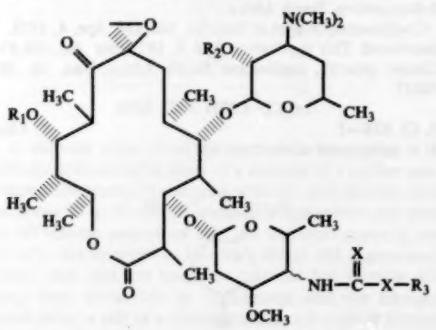
Robert F. Myers, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jan. 3, 1978, Ser. No. 866,891

Int. Cl.[2] C07H *17/08*; A01N *9/00*

U.S. Cl. 536—9 **11 Claims**

1. A compound having the formula:

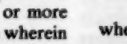


and the pharmaceutically acceptable salts thereof wherein

each of R_1 and R_2 is selected from the group consisting of hydrogen and alkanoyl having from two to three carbon atoms;

X is selected from the group consisting of O and S;

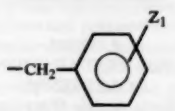
R_3 is selected from the group consisting of (i) a first subgroup consisting of:



wherein Z_1 is selected from the group consisting of hydrogen, chloro, bromo, carboalkoxy having from one to four carbon atoms in the alkoxy group, hydroxy, alkoxy having from one to four carbon atoms and dimethylamino;

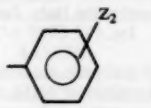
and n is an integer from 1 to 4; with the provisos that each Z_1 is hydroxy, chloro, bromo or dimethylamino, n is an integer from 2 to 4; and when X is O, Z_1 is other than hydroxy or dimethylamino;

(ii) a second subgroup consisting of:



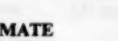
wherein Z_1 is as defined above.

(iii) a third subgroup consisting of:



wherein Z_2 is selected from the group consisting of hydrogen, chloro, bromo, carboalkoxy having from one to four carbon atoms in the alkoxy group, alkoxy having from one to four carbon atoms and alkyl having from one to four carbon atoms; and, when X is S,

(iv) a fourth subgroup consisting of:



4,133,951

VITAMIN B-12 COBALT-57 AND PROCESS

John C. Charlton, and Alan L. Hamilton, both of Amersham, England, assignors to The Radiochemical Centre Limited, England

Continuation of Ser. No. 576,361, May 8, 1975, abandoned. This application Mar. 17, 1976, Ser. No. 667,619

Int. Cl.[2] A61K *31/68*; C07H *23/00*

U.S. Cl. 536—25 **6 Claims**

1. A method of making cyanocobalamin labelled with Cobalt-57, which method comprises providing a reaction mixture containing from 0.2 to 50 molar parts of alpha-(5,6-dimethylbenzimidazolyl)hydrogenobamide and 1 molar part of a cobaltous compound in solution in a solvent which is inert to the reactants, the cobaltous ion of said cobaltous compound containing an abundance of Cobalt-57 higher than that found naturally,

effecting reaction therein between the alpha-(5,6-dimethylbenzimidazolyl)hydrogenobamide and the cobaltous ion with the production of hydroxocobalamin,

converting hydroxocobalamin to cyanocobalamin by reaction with excess cyanide ion, and

recovering cyanocobalamin labelled with Cobalt-57.

4,133,952
PROCESS AND INTERMEDIATE FOR PREPARING AURANOFIN

David T. Hill, North Wales, Pa.; Ivan Lantos, Blackwood, N.J., and Blaine M. Sutton, Hatboro, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Jun. 10, 1977, Ser. No. 805,496
Int. Cl.[2] C07H *23/00*
U.S. Cl. 536—121 4 Claims

1. The method of preparing auranofin comprising reacting S-gold-2,3,4,5-tetra-O-acetyl-1-thio-β-D-glucopyranose with a stoichiometric quantity of triethylphosphine in an inert aprotic organic solvent in which the two reactants are soluble.

4. S-Gold-2,3,4,5-tetra-O-acetyl-1-thio-β-D-glucopyranose.

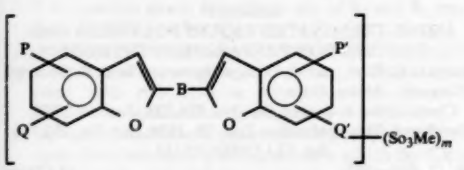
4,133,953
PROCESS FOR THE PREPARATION OF SULFONATED BENZOFURAN DERIVATIVES

Erich Schinzel, Hofheim am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 13, 1978, Ser. No. 885,349
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1977, 2711363
Int. Cl.[2] C07D *307/79, 307/82*
U.S. Cl. 542—454 4 Claims

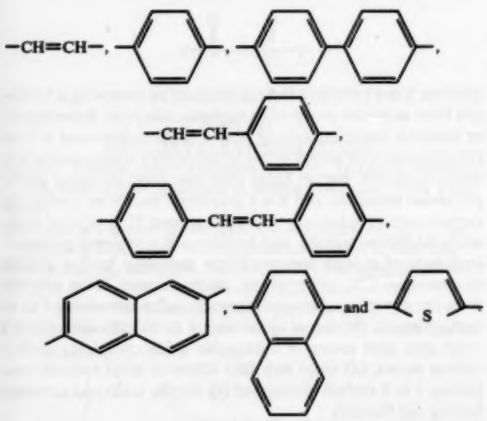
1. Process for the preparation of bis-[benzofuranyl-(2)] compounds of the general formula (I)

(I)



in which

B represents a direct bond or one of the groups specified below

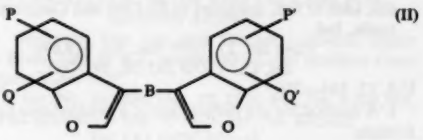


P, Q, P' and Q' represent, independent of each other, hydrogen or halogen atoms, lower alkyl, lower alkoxy or phenyl groups, optionally functionally modified carboxy groups, or P and Q as well as P' and Q' together stand for a lower alkylene radical or a fused benzene nucleus,

Me is hydrogen, an alkali metal or alkaline earth metal cation or an ammonium ion, and

m represents the numbers 1, 2, 3 and 4, which comprises allowing sulfuric acid having a content of from 90 to 100% to act upon bis-[benzofuranyl-(3)] compounds (II)

(II)



and isolating the mono- and polysulfonic acids formed as such or after conversion into their salts.

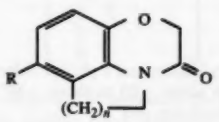
4,133,954
PYRROLO- AND PYRIDO-1,4-BENZOXAZIN-3-(2H)-ONE DERIVATIVES AS MICROBICIDES

Elmar Sturm, Aesch, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 10, 1977, Ser. No. 850,445
Claims priority, application Switzerland, Nov. 16, 1976, 14404/76
Int. Cl.[2] C07D *498/04*
U.S. Cl. 544—101 3 Claims

1. A compound of the formula I

(I)



wherein

n represents the number 1 and

R represents hydrogen, methyl or ethyl or

n represents the number 2 and

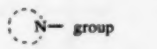
R represents methyl or ethyl.

4,133,955
PROCESS FOR THE PRODUCTION OF 2-EQUIVALENT YELLOW COUPLERS

Günter Renner, Cologne, Germany, assignor to AGFA-Gevaert Aktiengesellschaft, Germany

Filed Oct. 6, 1976, Ser. No. 730,204
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1975, 2545756
Int. Cl.[2] C07D *253/08;* G03C *1/40*
U.S. Cl. 544—183 9 Claims

1. In the process of converting a photographic 4-equivalent acyl acetamide yellow coupler to a 2-equivalent yellow coupler by a treatment that includes a reaction with a splittable-group-containing compound under basic condensation conditions that cause the active methylene carbon of the acyl acetamide to be substituted with a phenoxy or a heterocyclic



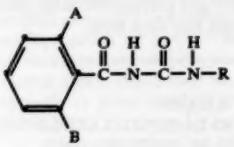
which will split off during chromogenic photographic development, the improvement according to which the conversion to a 2-equivalent coupler is effected in a single reaction stage by reacting the 4-equivalent coupler in a substantially aprotic solvent with the splittable-group-containing compound, and a halogen under the basic condensation conditions to cause the splittable group to substitute directly on the active methylene of the 4 -equivalent coupler.

4,133,956
PREPARATION OF BENZOYLUREAS

Riaz F. Abdulla, Greenfield, and Norman H. Terando, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

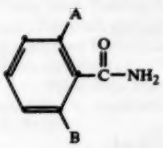
Filed Jul. 27, 1977, Ser. No. 819,639
Int. Cl.[2] C07D *241/20, 241/06*
U.S. Cl. 544—336 20 Claims

1. A method for the preparation of a benzoylurea having the formula



which comprises

(a) treating a benzamide having the formula



with a C_1–C_7 alkyllithium and a phenyl chloroformate in an inert solvent at about −80 to about −40° C. to form an intermediate urethane; and

(b) treating the intermediate urethane with an amine having the formula

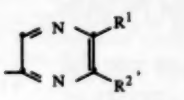
$R—NH_2$

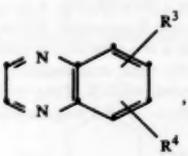
in an inert solvent at about −80 to about −40° C. and slowly raising the temperature of the mixture and heating at about 50° to about 100° C. to obtain the desired benzoylurea; wherein

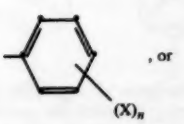
A is chloro, fluoro, bromo, methyl or trifluoromethyl;

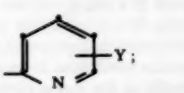
B is hydrogen, chloro, fluoro, bromo, methyl or trifluoromethyl;

R is

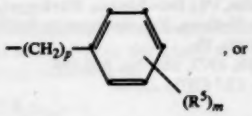


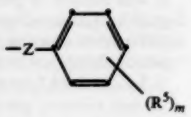






R^1 is hydrogen, halo, C_1–C_6 alkyl, halo(C_1–C_4 alkyl), cyano,





R^2 is hydrogen, halo, methyl, ethyl, cyano or halo(C_1–C_4)alkyl;

R^3 and R^4 are the same or different and are hydrogen, halo, C_1–C_6 alkyl, cyano or halo(C_1–C_4)alkyl;

R^5 is halo, halo(C_1–C_4)alkyl, C_1–C_6 alkyl, cyano or phenyl;

X is halo or C_1–C_4 alkyl;

y is halo;

Z is oxygen or sulfur;

n is 0, 1 or 2;

p is 0 or 1; and

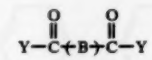
m is 0, 1, 2, or 3.

4,133,957
AMINE-TERMINATED LIQUID POLYMERS AND PROCESS FOR PREPARATION THEREOF

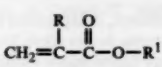
Changkiu K. Riew, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 586,723, Jun. 13, 1975, abandoned. This application Dec. 20, 1976, Ser. No. 752,706
Int. Cl.[2] C07D *295/12*
U.S. Cl. 544—357 24 Claims

1. An amine-terminated liquid polymer containing an average from about 1.5 to about 4 amine groups per molecule, said groups being primary, secondary or a mixture thereof, and said polymer having the formula



wherein Y is a univalent radical obtained by removing a hydrogen from an amine group of an aliphatic, alicyclic, heterocyclic or aromatic amine containing from 2 to 20 carbons and at least two secondary or mixed primary/secondary amine groups per amine molecule, but no more than one primary amine group per amine molecule, and B is a polymeric backbone containing carbon-carbon linkages comprising at least 95% of total polymeric backbone weight, said backbone B containing polymerized units of at least one vinylidene monomer having at least one terminal $CH_2{=}C<$ group, said monomer being selected from the group consisting of (a) monoolefins containing 2 to 14 carbon atoms, (b) dienes containing 4 to 10 carbon atoms, (c) vinyl and allyl esters of carboxylic acids containing 2 to 8 carbon atoms, (d) vinyl and allyl ethers of alkyl radicals containing 1 to 8 carbon atoms, and (e) acrylic acids and acrylates having the formula



said R being hydrogen or an alkyl radical containing 1 to 3 carbon atoms, and said R^1 being hydrogen, an alkyl radical containing 1 to 18 carbon atoms, or an alkoxyalkyl, alkylthioalkyl or cyanoalkyl radical containing 2 to 12 carbon atoms.

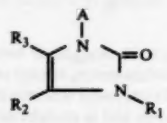
4,133,958

2-EQUIVALENT YELLOW COUPLERS

Immo Boie, Odenthal; Karl Küffner, Unterhaching; Gertrud Kirchhoff, Leverkusen, and Karl-Wilhelm Schranz, Langenfeld, all of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 606,423, Aug. 21, 1975, abandoned. This application May 6, 1977, Ser. No. 794,358
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1974, 2441779
Int. Cl.[2] C07D *233/70*
U.S. Cl. 548—321 5 Claims

1. A 2-equivalent yellow-forming coupler having the formula



in which

R_1 represents hydrogen; an alkyl group containing 1 to 4 carbon atoms; or an alkoxy carbonyl group in which the alkoxy group contains from 1 to 5 carbon atoms;

R_2 and R_3 represent either the same or different substituents selected from the group consisting of hydrogen, alkyl, and alkoxycarbonyl in which the alkoxy group contains from 1 to 5 carbon atoms, but at least one of R_2 and R_3 represents an alkoxy carbonyl group; or

R_2 and R_3 together represent the atoms required to complete a condensed benzene ring, which ring is further substituted with two chlorine atoms to form the 5, 6-dichlorobenzimidazolone group; and

A represents a radical of a yellow-forming coupler having an open-chain keto-methylene structure in which the methylene group is activated by two attached carbonyl groups or by one carbonyl and one cyano group, and the radical being obtained by removing a hydrogen atom from the activated methylene group of a 4-equivalent yellow-forming coupler.

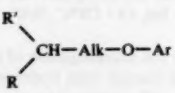
4,133,959

ARYLOXYALKYL DIKETONES

Joseph C. Collins, East Greenbush, and Guy D. Diana, Stephentown, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 576,311, May 12, 1975, Pat. No. 4,031,246, which is a continuation-in-part of Ser. No. 381,406, Jul. 23, 1973, Pat. No. 3,933,837. This application Sep. 21, 1976, Ser. No. 725,160
Int. Cl.[2] C07C *69/76*
U.S. Cl. 560—53 16 Claims

1. A compound of the formula



wherein:

Alk is alkylene of 3 to 10 carbon atoms;

R and R' are alkanoyl of 2 to 6 carbon atoms;

and Ar is phenyl substituted by a member of the group consisting of carboxy and carboalkoxy of 2 to 4 carbon atoms, optionally further substituted by a halogen atom.

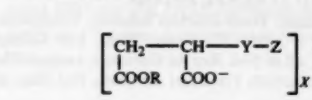
4,133,960

NOVEL ESTER DERIVATIVES OF ETHER POLYCARBOXYLIC ACIDS AND PROCESS FOR MAKING SAME

Eddie N. Gutierrez, Fort Lee, and Vincent Lamberti, Upper Saddle River, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 642,838, Dec. 22, 1975, Pat. No. 4,058,554. This application Sep. 9, 1977, Ser. No. 832,031
Int. Cl.[2] C07C *101/22*
U.S. Cl. 560—171 2 Claims

1. A compound of the formula



wherein R is a primary alkyl group of one to six carbon atoms,

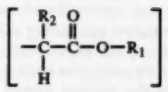
wherein M_1 is H, Ca, Mg, Ba, Sr, Na, K, or Li,

wherein x is 1 or 2 and is equivalent to the valency of M_1,

wherein Y is NH, and

wherein Z is

1) an ester moiety of the general formula:



wherein R_1 is isopropyl or secondary butyl, and wherein R_2 is hydrogen, methyl, ethyl, isopropyl, isobutyl, and secondary butyl.

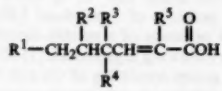
4,133,961

PROCESS FOR THE PRODUCTION OF UNSATURATED CARBOXYLIC ACIDS CONTAINING ADDITIONAL FUNCTIONAL GROUPS

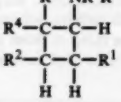
Windell C. Watkins, Henderson, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 17, 1977, Ser. No. 825,342
Int. Cl.[2] C07C *69/52*
U.S. Cl. 560—190 7 Claims

1. Process for the preparation of a compound having the formula



which comprises contacting a cyclobutane having the formula



wherein

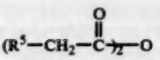
R^1 is lower alkoxycarbonyl, cyano or pyridyl;

R^2 is hydrogen or lower alkoxycarbonyl;

R^3 is lower alkyl;

R^4 is hydrogen or lower alkyl, or R^3 and R^4 in combination may be a methylene bridge containing three to five carbons; and

R^6 and R^7 are lower alkyl or, in combination, tetramethylene or pentamethylene; with an anhydride of the type



wherein R^5 is hydrogen, methyl or ethyl at a temperature of from about 30° C. to about 200° C. and a mole ratio of cyclobutane to acid anhydride of from about 2:1 to about 5:1.

4,133,962

PROCESS FOR THE PREPARATION OF CARBOXYLIC ACID ALKENYL ESTERS

Hans Fernholz, Kelkheim; Hans-Joachim Schmidt, Königstein, Taunus; Friedrich Wunder, Flörsheim, Main, and Günter Roscher, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 657,637, Feb. 12, 1976, abandoned. This application Feb. 22, 1977, Ser. No. 770,837

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1976, 2506141

Int. Cl.² C07C *67/05*

U.S. Cl. 560—245 **2 Claims**

1. In a process for the preparation of alkenyl esters of carboxylic acids in the gaseous phase by reaction of a carboxylic acid with an olefin and oxygen or oxygen containing gases at elevated temperature and optionally elevated pressure in the presence of a carrier catalyst containing palladium carboxylate and optionally activators, the improvement comprising, continuously or stepwise increasing the carboxylic acid concentration in the feed gas in the starting period of the process at a temperature from 100° to 250° C. until the final concentration is attained; the ratio of initial concentration to final concentration of carboxylic acid being 0.1 to 0.8, and the final concentration being attained after a period of from 1 to 60 hours.

4,133,963

PROCESS FOR THE PRODUCTION OF CARBOXYLIC ACIDS

Jerry D. Holmes, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 633,314, Nov. 19, 1975, abandoned. This application Aug. 3, 1977, Ser. No. 821,423

Int. Cl.² C07C *51/12, 67/36*

U.S. Cl. 562—519 **14 Claims**

1. A process for the production of a carboxylic acid by the reaction of a liquid lower alkanol with carbon monoxide at a temperature of from about 150° C. to about 250° C. and a carbon monoxide pressure of from about 2,000 psig to about 10,000 psig in the presence of a soluble liquid phase catalyst prepared from the following ingredients: (1) MX_n wherein M is selected from the group consisting of Co and Ni, X is selected from the group consisting of carboxylate anions of from 2 to 10 carbon atoms, halides, oxides, acetyl acetonate, carbon monoxide, and hydrogen; and n is from 1 to 5; (2) R_3P wherein R is alkyl, benzyl, phenyl, or alkylphenyl of from 4 to 10 carbon atoms; and (3) an iodide source selected from the group consisting of hydrogen iodide, iodine, alkyl iodides, alkali metal iodides and alkaline earth iodides, wherein the molar ratio of M to iodide source is in the ratio of from about 1:2 to about 1:10, and the molar ratio of M to R_3P is from about 1:0.5 to about 1:10.

4,133,964

α-ACETYLENIC DERIVATIVES OF α-AMINO ACIDS

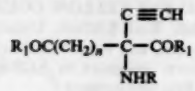
Brian W. Metcalf, Strasbourg, and Michel Jung, Illkirch Graffenstaden, both of France, assignors to Merrell Toraude et Compagnie, Strasbourg, France

Filed Jul. 1, 1977, Ser. No. 812,267

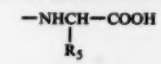
Int. Cl.² C07C *101/20, 101/22;* A61K *31/225*

U.S. Cl. 562—571 **6 Claims**

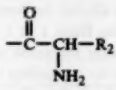
1. A compound of the formula



wherein n is an integer of from 1 to 3; each R_1 is the same and is hydroxy, a straight or branched alkoxy group of from 1 to 8 carbon atoms, $-NR_3R_4$ wherein each of R_3 and R_4 is hydrogen or a lower alkyl group of from 1 to 4 carbon atoms and can be the same or different, or



wherein R_5 is hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, benzyl or p-hydroxybenzyl; and R is hydrogen, alkylcarbonyl wherein the alkyl moiety has from 1 to 4 carbon atoms and is straight or branched, alkoxycarbonyl wherein the alkoxy moiety has from 1 to 4 carbon atoms and is straight or branched or



wherein R_2 is hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, benzyl or p-hydroxybenzyl; and pharmaceutically acceptable salts and individual optical isomers thereof.

4,133,965

PROCESS FOR PRODUCING TRICYCLO(5,2,1,$0^{2,6}$)-3-DECENE-8 (OR 9)-OL

Mitsuharu Kato; Toru Kikuchi, and Takayuki Saito, all of Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd., Japan

Filed Aug. 31, 1977, Ser. No. 829,475

Claims priority, application Japan, Sep. 8, 1976, 51-107569

Int. Cl.² C07C *29/04, 29/00*

U.S. Cl. 568—723 **12 Claims**

1. A process for producing tricyclo (5, 2, 1, $0^{2,6}$)-3-decene-8(or 9)-ol which comprises reacting dicyclopentadiene with water in the presence of a sufficient amount, to catalyze the reaction, of a heteropoly acid as a catalyst, under a pressure which is the same or higher than the water vapor pressure at a temperature at which the reaction is taking place.

4,133,966

SELECTIVE FORMATION OF ETHANOL FROM METHANOL, HYDROGEN AND CARBON MONOXIDE

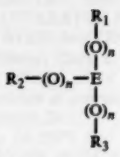
Wayne R. Pretzer, Oakmont Borough; Thaddeus P. Kobylinski, Gibsonia, and John E. Bozik, Plum Borough, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 23, 1977, Ser. No. 863,792

Int. Cl.² C07C *29/00*

U.S. Cl. 568—902 **23 Claims**

1. In a process for the homologation of methanol to ethanol wherein methanol is reacted with hydrogen and carbon monoxide in the presence of a catalyst at a reaction temperature of from about 150° C. to about 250° C. and a reaction pressure of from about 1000 psig (6.83 MPA) to about 6000 psig (40.98 MPA), the improvement which comprises contacting methanol, hydrogen and carbon monoxide with cobalt acetylacetonate, a tertiary organo Group V A compound of the periodic table of the formula:



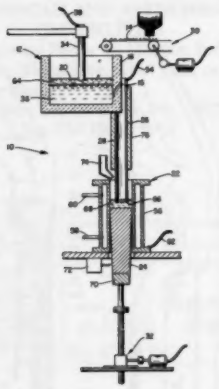
wherein E is a member selected from the group consisting of trivalent phosphorus, trivalent arsenic and trivalent antimony; and R_1, R_2, and R_3 are either alike or different members selected from the group consisting of saturated or unsaturated, straight or branched chain alkyl radicals having from about 1 to about 24 carbon atoms; aryl radicals having from about 6 to about 20 carbon atoms; alkenyl radicals having from about 1 to about 30 carbon atoms; cycloalkyl radicals having from about 3 to about 40 carbon atoms; aralkyl and alkaryl radicals having from about 6 to about 40 carbon atoms; and n is an integer of 0 or 1 with the provision that when n is 1, E must be phosphorus; an iodine promoter, and as a second promoter a ruthenium compound, said cobalt acetylacetonate and said tertiary organo Group V A compound being in a molar ratio of from about 1:20 to about 20:1, said cobalt acetylacetonate and said iodine promoter being in a molar ratio of from about 1:100 to about 100:1 and said cobalt acetylacetonate and said ruthenium compound being in a molar ratio of from about 1:20 to about 20:1.

4,133,967

TWO-STAGE ELECTRIC ARC - ELECTROSLAG PROCESS AND APPARATUS FOR CONTINUOUS STEELMAKING

Ralph H. Nafziger, Albany; Gary L. Hundley, Corvallis, and Ronald R. Jordan, Albany, all of Oreg., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jun. 24, 1977, Ser. No. 809,879
Int. Cl.[2] F27B *19/04;* F27D *15/00*
U.S. Cl. 13—9 ES 7 Claims



1. A two-stage electric arc — electroslag apparatus comprising:

(a) an electric arc furnace for melting metal ore, the furnace having an outlet in a sidewall thereof for continuously withdrawing molten metal therefrom, the outlet comprising an inner end and an outer end, the inner end being disposed below the outer end,

(b) an electroslag furnace positioned below the electric arc furnace for receiving the molten metal therefrom and continuously forming a metal ingot, and

(c) an electrode having a hollow core extending between the outlet of the electric arc furnace and the electroslag furnace for containing the molten metal as it moves therebetween.

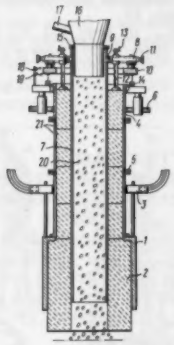
4,133,968

APPARATUS FOR FORMING SELF-SINTERING ELECTRODES

Jury F. Frolov, M. Muranovskaya ulitsa, 11, korpus 1, kv. 29., Moscow, U.S.S.R.

Filed May 26, 1977, Ser. No. 800,616
Int. Cl.[2] H05B *7/107*
U.S. Cl. 13—18 R 9 Claims

1. An apparatus for forming self-sintering electrodes, comprising a permanent current-carrying mold for forming a self-sintering electrode; a charge-feeding tube concentrically disposed within said mold; a power lead electrically connected to the mold; a drive for moving said self-sintering electrode; a device for feeding and pressing electrode material; a supporting cylinder enveloping said charge-feeding tube and mounted concentrically therewith, said cylinder having a top part attached to said drive for electrode movement and a bottom part connected to said mold, said device for feeding and pressing electrode material being located in a space between top portions of said supporting cylinder and said charge-feeding tube and being attached to a cross beam; and means for moving said



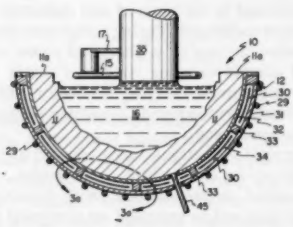
cross beam upwards and downwards mounted on said drive for moving said electrode.

4,133,969

HIGH FREQUENCY RESISTANCE MELTING FURNACE

Allen D. Zumbrunnen, 419 Sherman Ave., Salt Lake City, Utah 84115

Filed Jan. 3, 1978, Ser. No. 866,355
Int. Cl.[2] H05B *3/60*
U.S. Cl. 13—23 26 Claims



1. An electric furnace comprising,

a high frequency current source;

a heat absorbing container;

a skull formed to fit within said container from an electrically conductive material, the skull formed to have an open center portion to contain a melt of an electrically conductive material to be melted;

a forward conductor arranged over and substantially parallel to the container and skull top therein, said forward conductor spaced appropriately from a material to be melted in said skull such that a current passage therethrough will cause a return current through said melt to follow a path that approximates the shape of said forward conductor;

means for connecting said high frequency current source to one end of said forward conductor;

forward and return contact means installed in said skull;

means for connecting said forward contact to the other end of said forward conductor;

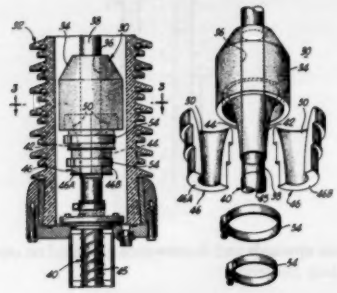
means for connecting said return contact means to said high frequency current source; and

cooling means for providing a heat transfer from said skull for maintaining said skull in a solid state.

4,133,970
ELECTRICAL INSULATION SYSTEM

George E. Lusk, Woodstock, Ill., assignor to Joslyn Mfg. and Supply Co., Chicago, Ill.

Filed Dec. 30, 1975, Ser. No. 645,387
Int. Cl.[2] H02G 15/22; H01B 3/20, 3/30
U.S. Cl. 174—19 36 Claims



1. An interrelated group of components capable of being assembled to form a high voltage electrical insulation system comprising

means adapted to be disposed about a high voltage current carrying component for electrically insulating said high voltage current carrying component, said electrically insulating means comprising a porous, open cell, polymeric, dielectric solid having a plurality of pores and

dielectric means for impregnating said solid and adapted to fill said pores, said dielectric impregnating means comprising a non-gaseous dielectric impregnant, said dielectric impregnant comprising a dielectric gel adapted to be immobilized in the pores of said dielectric solid.

24. A cable termination having component parts and capable of terminating the end of an elongated power cable having an elongated current carrying conductor, cable insulation surrounding said current carrying conductor and an outer conductive sheath surrounding an elongated portion of said cable insulation, comprising

an outer rigid dielectric housing adapted to receive said end of said power cable within said housing,

an elongated electrical stress relief device adapted to be fitted over and to surround an elongated portion of said cable insulation, said electrical stress relief device comprising a porous, open cell, polymeric, dielectric solid having a plurality of pores and means for impregnating said dielectric solid and adapted to fill said pores, said impregnating means comprising a non-gaseous dielectric impregnant.

4,133,971
HAND GRIP MOUNTED SWITCH AND STRAIN RELIEF

Wilton E. Boyd, Canton, and Donald R. Bowers, Akron, both of Ohio, assignors to The Hoover Company, North Canton, Ohio

Filed Feb. 9, 1977, Ser. No. 766,894
Int. Cl.[2] A47L 9/32; H01H 9/06; B25G 1/00
U.S. Cl. 174—46 8 Claims

4. A handle arrangement for an electrical appliance, the handle arrangement having an axial direction, the combination including;

(a) a switch mounted with said handle arrangement,

(b) a switch retaining member holding said switch in its mounted position,

(c) a strain relief mounted with said handle arrangement,

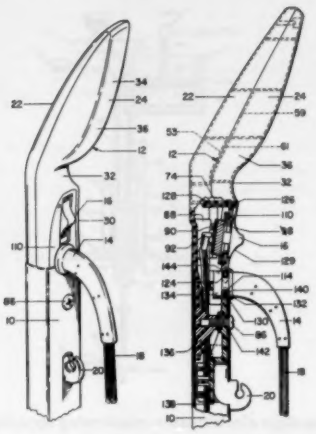
(d) said switch retaining member including a portion having a cutout,

(e) said switch retaining member including means jammingly engaging said handle arrangement for compressive axial urging of said cutout portion of said switch retaining member against said strain relief,

(f) said means jammingly engaging said handle arrangement comprising an inwardly extending post, and

(g) said post engaging against an abutment means fixed relative to said handle arrangement to provide said axial urging, one said post and said abutment means being resilient and bendingly engaging the other.

8. A switch retaining plate, switch, abutment means and strain relief combination including;



(a) said switch retaining plate having a generally planar expanse,

(b) an aperture extending through said generally planar expanse,

(c) a switch extending through said aperture,

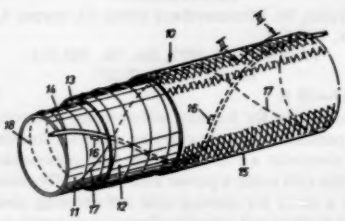
(d) a finger on said switch retaining plate projecting generally perpendicularly to said generally planar expanse,

(e) one of said finger and said abutment means being resilient, bendable and deformable so that, upon deformation of one of said finger and said abutment means, said switch retaining plate is urged against said strain relief.

4,133,972
VACUUM CLEANER HOSE HAVING AN ELECTRICAL CONDUCTOR

John N. J. Andersson, Tullinge; Harry K. G. Karlen, Bromma, and Lennart A. U. Ulfhielm, Stockholm, all of Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Jan. 19, 1977, Ser. No. 760,417
Claims priority, application Sweden, Jan. 26, 1976, 7600738
Int. Cl.[2] A47L 9/24; F16L 11/12
U.S. Cl. 174—47 6 Claims



1. A vacuum cleaner hose comprising an inner flexible tube and an outer flexible tube, at least one electrical conductor arranged in a space between said tubes in a spiral configuration, said inner and outer tubes having diameters that are so chosen that said electrical conductor freely moves both longi-

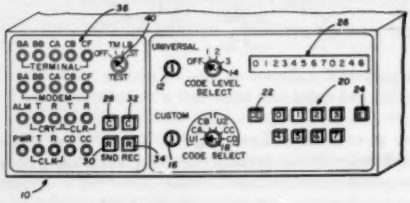
tudinally and laterally in the space between said tubes, said electrical conductor thereby being not subject to stretching forces when said hose is bent out of a linear configuration, and said hose being provided with spacing means located in said space between said inner and outer tubes which engage said electrical conductor at selected locations for maintaining the spiral configuration of said electrical conductor.

4,133,973

DIGITAL CRYPTOGRAPHIC SYSTEM HAVING SYNCHRONOUS AND ASYNCHRONOUS CAPABILITIES

Kenneth M. Branscome; Barrie O. Morgan, both of Dallas, and Merlon B. Carter, Richardson, all of Tex., assignors to Datotek, Inc., Dallas, Tex.

Filed Nov. 10, 1976, Ser. No. 740,599
Int. Cl.[2] H04L *9/02*
U.S. Cl. 178—22 **26 Claims**



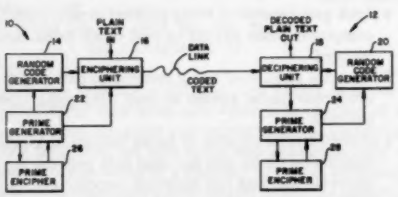
7. A digital cryptographic system comprising:
a housing,
means on said housing for inputting first and second different code variables,
means in said housing for storing said code variables,
switch means on said housing for selecting any one or pairs of said first and second stored code variables,
a random code generator in said housing responsive to the selected code variable for generating a stream of randomized key digital bits,
means in said housing for receiving clear text digital data, and
means responsive to said key digital bits for enciphering said clear text digital data and for generating an enciphered digital signal.

4,133,974

SYSTEM FOR LOCALLY ENCIPHERING PRIME DATA

Barrie O. Morgan, Dallas, Tex., assignor to Datotek, Inc., Dallas, Tex.

Filed Nov. 5, 1976, Ser. No. 741,502
Int. Cl.[2] H04L *9/02*
U.S. Cl. 178—22 **14 Claims**



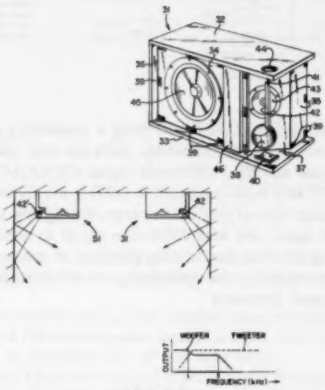
1. In a digital cryptographic system having a digital prime sequence for controlling the generation of randomized key data at a local station and at a remote station, the combination comprising:
means for transmitting the digital prime sequence from the local station to the remote station,
multistage means for storing the digital prime sequence at the local station prior to generation of the randomized key data,
means responsive to a portion of said stored prime sequence for enciphering said stored prime sequence,
means for replacing the contents of said multistage means with said enciphered prime sequence, and
means for applying the contents of said multistage means to control the generation of the randomized key data.

4,133,975

LOUDSPEAKER SYSTEM WITH BROAD IMAGE SOURCE WITH DIRECTIONALITY CONTROL FOR THE TWEETER

Charles R. Barker, III, Harvard, Mass., assignor to Bose Corporation, Framingham, Mass.

Continuation of Ser. No. 564,543, Apr. 2, 1975, abandoned. This application Jan. 24, 1977, Ser. No. 762,017
Int. Cl.[2] H04R *1/20, 1/28*
U.S. Cl. 179—1 E **15 Claims**



1. A loudspeaker system comprising,
means defining an enclosure having top, bottom, rear and at least one side panel, a front baffle for supporting woofer means for radiating low audio frequency signals and an angled baffle adjacent to said front baffle and to tweeter means for directionally radiating high audio frequency signals,
said woofer means supported on said front baffle,
said tweeter means supported adjacent to said angled baffle and characterized by a directional radiation pattern having a maximum direction of radiation oriented along an axis directed both forward and sideward of said front baffle,
knob means supported by said top panel in the region above said tweeter means,
and means including said knob means for selectively positioning said maximum of radiation between a front end position with said direction of radiation more forward than sidewards and a side end position with said direction of radiation more sideward than forward.

4,133,976

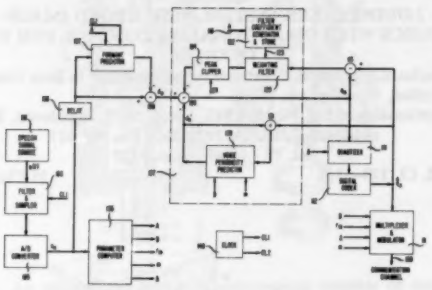
PREDICTIVE SPEECH SIGNAL CODING WITH REDUCED NOISE EFFECTS

Bishnu S. Atal, Murray Hill, N.J., and Manfred R. Schroeder, Gottingen, Fed. Rep. of Germany, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 7, 1978, Ser. No. 894,329
Int. Cl.[2] G10L *1/00*
U.S. Cl. 179—1 P **14 Claims**

1. A predictive speech signal communication system com-

prising apparatus (135) for analyzing a speech signal in selected time intervals to generate a set of formant related prediction parameter signals for each interval; circuitry (107,109) jointly responsive to said speech signal and said formant related prediction parameter signals for producing a signal representative of the difference between said speech signal and its predicted value; a modifying circuit (137) for modifying said difference representative signal; a quantizer (111) responsive to said modified difference signal for generating a quantized signal; and a



subtracter circuit (113) for forming a quantizing error signal corresponding to the difference between said quantized and unquantized modified difference signal CHARACTERIZED IN THAT said modifying circuit (137) is jointly responsive to said formant related prediction parameter signals, said quantizing error signal and said difference signal to concentrate the quantizing error in the formant portions of said speech signal spectrum whereby the quantizing error is masked by said speech signal formants.

4,133,977

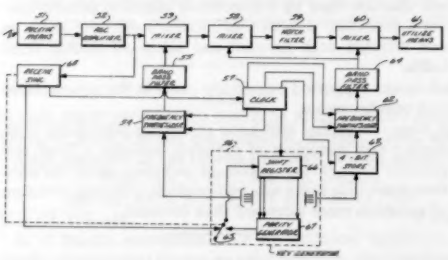
VOICE SCRAMBLER USING SYLLABIC MASKING

Hubert E. McGuire, Plantation, Fla., and William H. Draeger, Corona, Calif., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Continuation of Ser. No. 597,075, Jul. 18, 1975, which is a continuation-in-part of Ser. No. 467,223, May 6, 1974, abandoned. This application Feb. 25, 1977, Ser. No. 772,087

Int. Cl.[2] H04L *1/02*

U.S. Cl. 179—1.5 M **16 Claims**



1. A method of communicating in secrecy comprising the steps of adding to the intelligence signals to be communicated a masking signal having a frequency that randomly varies between a plurality of discrete frequencies within the bandwidth of the intelligence, mixing the combined signals with a carrier signal having a frequency that randomly varies between a plurality of discrete frequencies, and removing the mask signal by double frequency translation and filtering.

4,133,978

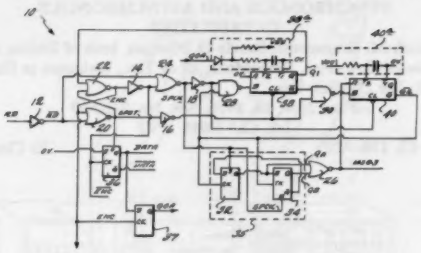
CIRCUIT FOR SEPARATING A COMPOSITE STREAM OF DATA AND CLOCK PULSES

Clarence W. Hewlett, Jr., Waynesboro, Va., assignor to General Electric Company, Waynesboro, Va.

Filed Aug. 25, 1977, Ser. No. 827,669

Int. Cl.[2] H04J *3/06*; H04L *7/02*

U.S. Cl. 179—15 BS **43 Claims**



1. A method of separating into a data pulse stream and a clock pulse stream serially occurring electrical pulses from a composite pulse stream of serially occurring interspersed data and clock pulses, said composite pulse stream including clock pulses normally occurring during time intervals which recur at a regular nominally periodic rate except during a predetermined number of such time intervals wherein such clock pulses may not be present, said method comprising the steps of:

first passing the next encountered pulse in said composite pulse stream to the clock pulse stream;

subsequently passing pulses from the composite pulse stream occurring during subsequent alternating recurrent time intervals to said data pulse stream and to said clock pulse stream respectively;

detecting and counting the number of non-occurrences of clock pulses in the resulting clock pulse stream;

after detecting and counting the number of non-occurrences of clock pulses in said predetermined number of time intervals, repeating all of the above-recited steps.

15. A circuit for separating a composite serial pulse stream of clock and data pulses into a separate clock pulse stream and a separate data pulse stream wherein said composite pulse stream comprises successive bit cell time intervals, each bit cell time interval including a clock cell time interval and a data cell time interval, all such time intervals recurring at a nominal periodic rate and wherein clock pulses are normally present during all but a predetermined number of clock cells, and said circuit comprising:

a clock gate capable of being enabled to pass pulses from said composite pulse stream to said clock pulse stream when enabled;

a data gate capable of being enabled to pass pulses from said composite pulse stream to said data pulse stream when enabled;

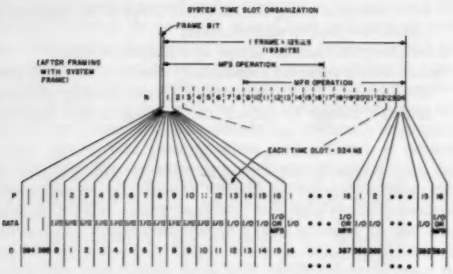
a control circuit capable of being initialized to alternatively enable said clock gate and said data gate during clock cell intervals and data cell intervals respectively, the timing of said clock cell and data cell intervals being defined by a pulse from the composite pulse stream initially assigned to a predetermined one of said clock and data pulse streams, and

counter means for counting the number of non-occurrences of clock pulses in the resulting clock pulse stream and for initializing said control circuit whenever such count reaches said predetermined number.

4,133,979
MULTIFREQUENCY SENDER/RECEIVER IN A MULTI-TIME SLOT DIGITAL DATA STREAM

Bradley A. Helliwell, and James R. Baichtal, both of Los Gatos, Calif., assignors to TRW, Inc., Los Angeles, Calif.

Filed Jan. 26, 1977, Ser. No. 762,809
Int. Cl.[2] H04J 3/12
U.S. Cl. 179—15 BY 10 Claims



1. In a telephone system having an interface including an input portion connected to a multitime slot input bus for receiving input telephone signals and having an output portion connected to a multitime slot output bus for transmitting output telephone signals, said system operating with the telephone signals in time frames each consisting of a plurality of time slots, the apparatus comprising:

sender means connected to said input bus for generating and connecting selected tone signals in pulse code modulated format representative of a multifrequency tone pair to selected ones of said time slots on said input bus,

receiver means connected to said output bus, said receiver means responsive to the presence of other tone signals in pulse code modulated format representative of a multifrequency tone pair in selected others of said time slots on said output bus, thereby providing a data signal representative of one of said tone pairs,

means for connecting said input portions to said output portions whereby said input telephone signals become output telephone signals, and

system controller means for specifying said selected tone signals, said selected ones of said time slots and for receiving said data signal whereby some of said selected ones and others of said time slots are dedicated to sending and receiving tone signals, respectively, and some are available for either sending or receiving tone signals.

4,133,980
DATA PULSE REGISTER/SENDER FOR A TDM SWITCHING SYSTEM

Johannes A. R. Moed, San Jose, Calif., assignor to TRW, Inc., Los Angeles, Calif.

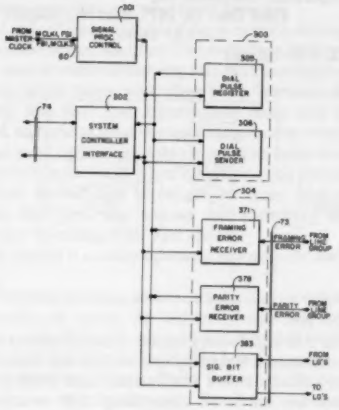
Filed Jan. 26, 1977, Ser. No. 762,801
Int. Cl.[2] H04J 3/12
U.S. Cl. 179—15 BY 21 Claims

1. In a telephone system operating in time frames each consisting of plurality of time slots, said systems connected to a plurality of multitime-slot input and output buses for switching data between time slots on said buses and operating with a multiframe format consisting of a plurality of frames including signaling frames having supervisory signals where the supervisory signals occur as a signaling bit in time slots on said buses during the signaling frames, a dial pulse register/sender comprising:

register means connected to receive said supervisory signals in said time slots on said input buses for detecting a change of state of a supervisory signal during a signaling frame for each of said time slots whereby said register means provides a change of state signal when a supervisory signal for any of said time slots changes from one state to another state for a predetermined period of time, and

sender means connected to said output buses for sending a supervisory signal representing said one state or said another state to each of said time slots on said output buses.

19. In a telephone system operating in time frames, each consisting of a plurality of time slots, said system connected to a plurality of multitime-slot input and output buses for switching data between time slots on said buses and operating with a multiframe format consisting of a plurality of frames including signaling frames having supervisory signals where the supervisory signals occur as a signaling bit in respective time slots on said buses during the signaling frames, a dial pulse sender comprising:



memory means for storing one control count for each of said time slots representing one state of a supervisory signal to be sent to specified ones of said time slots,

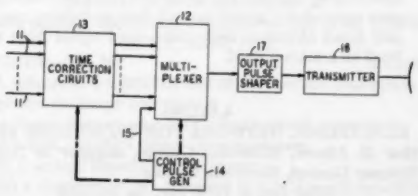
logic means, responsive to said control count for each of said time slots, for sending a supervisory signal having a state corresponding to said one control count to each of said time slots, and

control means for specifying said time slots.

4,133,981
TIME CORRECTION CIRCUIT FOR A DIGITAL MULTIPLEXER

Lynden U. Kibler, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 19, 1977, Ser. No. 861,865
Int. Cl.[2] H04J 3/06
U.S. Cl. 179—15 BS 4 Claims



1. In a communication system wherein a plurality of incoming digital lines respectively deliver a plurality of digital message bit streams of predetermined bit rate to a digital multiplexer, said multiplexer serving to sample each input pulse on each incoming line, a time correction circuit for each incoming line characterized by means for making a relative time comparison of each input pulse on a line with a respective control

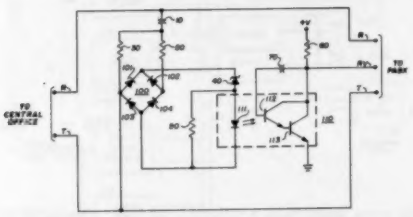
pulse derived from a respective multiplexer sampling pulse, and means operative in response to each relative comparison to selectively invert and shorten or lengthen in a non-discrete manner each input pulse so that a portion of each input pulse will be in the proper time position to be correctly sampled by the multiplexer.

4,133,982

AC SUPERVISORY SIGNAL DETECTOR CIRCUIT

David Q. Lee, Chicago, and Richard M. Rovnyak, Schaumburg, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 23, 1977, Ser. No. 864,051
Int. Cl.[2] H04M *7/00*
U.S. Cl. 179—18 AH **4 Claims**



1. An AC supervisory signal detector circuit for use in a telephone system including at least first and second switching centers connected via a trunk circuit, said trunk circuit having first and second leads connecting said switching centers, bridge rectifier circuit means connected to said first and said second leads of said trunk circuit and an optical coupler including a light emitting diode and a photosensitive semiconductor device operable to generate an output signal level shift for transmission to said second switching center, the improvement comprising:

a high impedance network including a capacitor and first and second resistors, each of said resistors connected to a different input of said bridge rectifier circuit means and further connected in common to said second lead through said capacitor and said second resistor further connected to said first lead, operated to couple said supervisory signal detector circuit permanently to said trunk circuit;

current control means including a Zener diode series connected between a first output of said bridge rectifier circuit means and said light emitting diode and a resistor shunt connected across said light emitting diode and between said Zener diode and a second output of said bridge rectifier circuit means, operated to enable said supervisory signal detector circuit to function as an open circuit during voice transmission; and

energy storage means connected to said optical coupler operated in response to application of an alternating current supervisory signal by said first switching center to said trunk circuit to shift said output signal from a first level to a second level.

4,133,983

ELECTRONIC NETWORK FOR TELEPHONE SET

Arthur D. Moore, Stittsville, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jan. 6, 1978, Ser. No. 867,438
Claims priority, application Canada, Jan. 10, 1977, 269418
Int. Cl.[2] H04M *1/58*; H04B *3/38*
U.S. Cl. 179—81 B **4 Claims**

1. In an electronic telephone network, for connecting a microphone, a receiver and a line powered tone generator to a line powered telephone line, comprising:

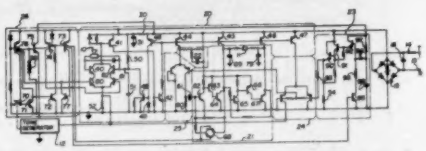
a line terminating resistor and a line terminating capacitor connected in series across said telephone line;

a line powered transmit amplifier, one input of which is connected to said microphone, another input of which is connected to the line powered tone generator, and the output of which is connected across said telephone line;

a line powered receive amplifier, one input of which is connected through an impedance network to the telephone line, another input of which is connected to the transmit amplifier at a point where the transmitter signals are out-of-phase with those on said line; and the output of which is connected across said receiver; the impedance network controlling the side-tone level of the transmitter signals coupled to said receiver;

a d-c clamp connected across said telephone line;

switch means actuated substantially concurrently with actuation of said tone generator, for concurrently disabling said d-c clamp to reduce the loading across said line,



disconnecting said microphone from the input to said transmit amplifier and connecting said tone generator to said input;

the improvement comprising:

a first resistor and capacitor serially connected across said line capacitor, the line voltage drop across said first capacitor controlling the d-c clamping voltage of said d-c clamp; the first resistor and capacitor coacting with the line terminating resistor and capacitor as a first two-stage R-C low pass filter;

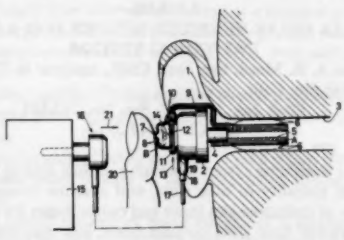
a second resistor and capacitor serially connected across said line capacitor, the line voltage drop across said second capacitor being the d-c bias voltage of the input to said transmit amplifier, the second resistor and capacitor coacting with the line terminating resistor and capacitor as a second two-stage R-C low-pass filter.

4,133,984

PLUG-TYPE HEARING DEVICE

Taichiro Akiyama, Tokyo, Japan, assignor to Koken Co., Ltd., Tokyo, Japan

Filed Aug. 3, 1977, Ser. No. 821,547
Claims priority, application Japan, Sep. 1, 1976, 51-104383
Int. Cl.[2] H04R *1/10, 25/02*
U.S. Cl. 179—107 E **28 Claims**



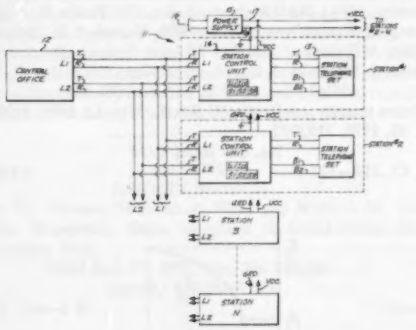
1. In a plug-type hearing device including a sound-conducting portion for insertion into the auditory miatus and for introducing a sound thereinto, a first envelope of elastic material formed around said sound-conducting portion, a fluid, and a passage for said fluid connected at one end to said first envelope for supplying said fluid to the first envelope from a source connected to the other end of the passage, expanding means for expanding said first envelope within the miatus by supplying

said fluid thereinto, and holding means for maintaining the expanded state of said first envelope, said expanded first envelope being closely contacted with a wall surface forming said auditory miatus, the improvement in said expanding and holding means comprising a resiliently deformable valve disposed in said passage for said fluid, and means for applying pressure to said fluid comprising a second envelope communicating with said first envelope through said passage and disposed outside of said auditory miatus, the volume of said second envelope being decreased to increase the volume of said first envelope through the pressure of said fluid, said second envelope being made of an elastic material and being attached to a main body of an earphone having said sound-conducting portion, said valve being resiliently deformable by the pressure of said fluid whereby the fluid can pass through said valve into said first envelope, and said valve being resiliently returned to a state closing said passage when said pressure is relieved whereby said first envelope is held in the expanded state, said valve comprising a check valve, and including means for opening said valve to return said fluid into said second envelope, said opening means comprising a pipe attached to the inner wall of said second envelope, said pipe being adapted to be forced into engagement with said check valve to open the check valve.

4,133,985
KEY TELEPHONE SYSTEM

Harry R. Rasmussen, Tacoma; Gene A. Kimzey, Puyallup, both of Wash., and Robert D. Hailey, San Jose, Calif., assignors to Crest Industries, Inc., Puyallup, Wash.

Filed Oct. 17, 1977, Ser. No. 842,569
Int. Cl.[2] H04M 1/00
U.S. Cl. 179—99 **7 Claims**



1. A control unit for each of a plurality of single-line telephone sets for converting such sets into a multiple-line key telephone system which has the capability of indicating on-hook, off-hook and hold conditions on each of a plurality of telephone lines connected to the system, comprising:

first and second line input means adapted to be separately connected to first and second telephone lines, respectively;

output means adapted to be connected to a telephone set;

first and second hold control means separately connected to said first and second line input means, respectively, for selectively placing the lines connected thereto in a hold condition;

line condition sensing circuit means having:

first and second line condition sensing means separately coupled to said first and second line input means, respectively, for sensing on-hook, off-hook and hold conditions on the respective lines connected to said first and second input means, each of said first and second line condition sensing means having an output at which a control signal is produced for indicating whether the associated telephone line is in an on-hook condition, an off-hook condition or a hold condition, and

first and second electrically operated indicating means, said first indicating means being responsive to said control signal at the output of said first line condition sensing means for indicating on-hook, off-hook and hold conditions on the telephone line connected to said first line input means, and said second indicating means being responsive to the control signal at the output of said second line condition sensing means for indicating on-hook, off-hook and hold conditions on a telephone line connected to said second line input means;

line selection switching circuit means having:

first and second line switching devices each having first and second states, said first line switching device when in its second state connecting said first line input means to said output means and when in its first state disconnecting said first line input means from said output means, and said second line switching device when in its second state connecting said second line input means to said output means and when in its first state disconnecting said second line input means from said output means, said first and second line switching devices normally assuming their first states,

first and second manually operable line selector switches, and

first and second latching means each having an output and a plurality of inputs, the output of said first latching means controlling the state of said first line switching device and the inputs of said first latching means being responsive to operation of said first manually operable line selector switch when said first line condition sensing means senses an off-hook condition on the line connected to said first input means to latch said first line switching device in its second state so long as said off-hook condition continues to be sensed by said first line condition sensing means, the output of said second latching means controlling the state of said second line switching device and the inputs of said second latching means being responsive to the operation of said second manually operable selector switch when said second line condition sensing means senses an off-hook condition on the line connected to said second line input means to latch said second line switching device in its second state so long as said second line condition sensing means continues to sense such off-hook condition.

4,133,986
SUBSCRIBER'S LINE EQUIPMENT FOR A TELEPHONE EXCHANGE

Jean A. Picandet, Paris, and André N. Baratin, Neuilly sur Seine, both of France, assignors to Jeumont-Schneider, Puteaux, France

Filed Nov. 16, 1977, Ser. No. 851,871
Claims priority, application France, Nov. 25, 1976, 76 35606
Int. Cl.[2] H04B 1/58
U.S. Cl. 179—170 NC **3 Claims**

1. A subscriber's telephone line equipment for connection to a telephone exchange comprising:

(a) a direct current supplying circuit which comprises:

(i) a first, constant direct current source;

(ii) a second direct current source;

(iii) a chopper circuit arranged in a bridge configuration, having four symmetrical arms;

(iv) voltage-doubling rectifying means connected to the ends of one diagonal of said chopper circuit;

(v) a decoupling capacitor shunting the ends of the other diagonal of said chopper circuit, said capacitor also being connected in series to said first and second current sources;

(vi) control means for supplying said chopper circuit control signals in the form of rectangular pulses having

a duty factor of 0.5 and a radio frequency repetition frequency;

(vii) a first resistor connected in series between said second current source and said chopper circuit;

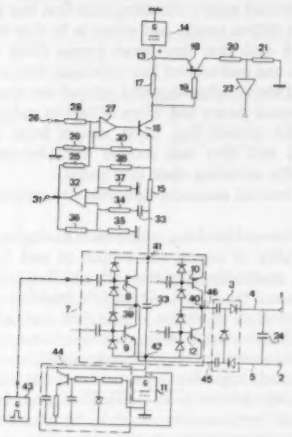
(viii) a current-limiting circuit connected in series between said first current source and said chopper circuit; and

(ix) a capacitor shunting said subscriber's line;

(b) a first circuit for transmitting from said telephone exchange to said subscriber's line which comprises:

(i) an emitter-follower connected transistor whose emitter-collector circuit is connected in series between said first resistor and said second current source; and

(ii) a first amplifier connected to the base of said emitter-follower connected transistor;



(c) a second circuit for transmitting voice signals from said subscriber's line to said telephone exchange which comprises:

(i) a second, differential amplifier; and

(ii) an anti-sidetone circuit connected between the inputs of said second amplifier and the terminals of said first resistor;

(d) a second resistor connected in series between said second current source and said emitter-collector circuit of said emitter-follower connected transistor; and

(e) a threshold circuit connected to the terminals of said second resistor for deliverying a signal, the level of which represents the state of the subscriber's loop.

4,133,987

ELECTRODE ASSEMBLY FOR PLASMA ARC TORCHES

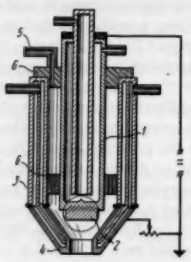
Viktor I. Lakomsky, Zaporozhie; Georgy M. Grigorenko, Kiev; Gennady F. Torkhov, Kiev; Gary A. Melnik, Kiev, and Vitaly S. Nesmikh, Kiev, all of U.S.S.R., assignors to Institut Elektrosvarki Imeni E.O. Patona Adakemii Nauk, Kiev, U.S.S.R.

Filed Dec. 7, 1977, Ser. No. 858,242

Int. Cl.² B23K *9/00*

U.S. Cl. 219—121 P **3 Claims**

1. An electrode assembly for plasma-arc torches, comprising an electrode holder made of copper or copper alloys and a tungsten electrode rigidly secured to a butt portion thereof, the tungsten electrode and the electrode holder being connected to



each other using a current-conducting interlayer made of titanium, copper and tungsten.

4,133,988

METHOD OF PLASMA ARC CUTTING CONTROL AND A DEVICE FOR REALIZING SAME

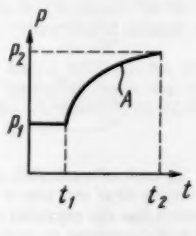
Eduard M. Esibyan, ulitsa Kikvidze, 4, kv. 21; Mikhail E. Danchenko, ulitsa B.Likhacheva, 3, kv. 53; Vasily B. Malkin, prospekt Voroshilova, 31, kv. 305; Vsevolod D. Dotsenko, ulitsa Miljutenko, 28a, kv. 33, and Grigory B. Asoyants, bulvar L.Ukrainki, 2, kv. 16, all of Kiev, U.S.S.R.

Filed Mar. 8, 1976, Ser. No. 664,432

Claims priority, application U.S.S.R., Mar. 12, 1975, 2109052; Oct. 30, 1975, 2182702

Int. Cl.² B23K *9/16*

U.S. Cl. 219—121 P **2 Claims**



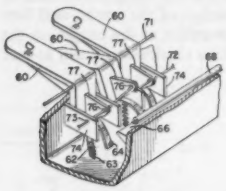
1. A method of controlling a cutting torch for plasma arc cutting, in which the cutting process is carried out at a predetermined, constant flow rate of a plasma-forming gas, characterized by the steps of supplying the plasma-forming gas to the torch at its desired flow rate; instantaneously closing an outlet nozzle opening of the cutting torch; continuously measuring the pressure of the plasma-forming gas and producing a curve describing the pressure characteristics changes as a function of time; and thereafter supplying an electric current for feeding a cutting arc, and wherein said current is supplied in two stages: firstly, said current is supplied as a step or jump to a current value approximately equal to one-half of the desired cutting current value for a particular cutting condition, and, secondly, said current is gradually increased according to the measured pressure change function up to the value of the desired cutting current.

4,133,989

DEVICE TO IDENTIFY CHORDS ON A KEYBOARD INSTRUMENT AND KEY MECHANISM FOR USE THEREWITH

Juan M. del Castillo, Risco 119, Mexico 20, D. F., Mexico

Division of Ser. No. 656,881, Feb. 10, 1976, Pat. No. 4,061,072.
This application Jan. 24, 1977, Ser. No. 761,576
Int. Cl.[2] H01H *9/20*; G10C *3/12*
U.S. Cl. 200—5 E **3 Claims**



1. A key operated mechanism comprising

a plurality of keys, each having a surface for applying a force thereto for depression of each of said keys;

means for pivotally mounting each of said keys on a pivot axis;

a portion extending from each of said keys on the opposite side of said pivot axis of each of said keys from said force applying surface;

cord-like means preventing actuatiion of more than one key at a time tautly strung through each of said portions and said cord-like means anchored on its opposite ends;

compression spring means connected to each of said keys between a position on each key and an anchor point to pass through a point of maximum compression at an intermediate point between positions of each key between its original undepressed position and depressed position

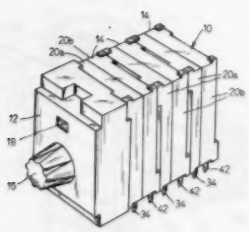
said cord-like means being sufficiently taut so as to straighten at its connection to a depressed one of said keys upon depression of another of said keys with a force sufficient to overcome the force of said spring means.

4,133,990

ROTARY SWITCH

Vernon W. Wanner, Milwaukee, Wis., and Richard W. Germuska, Brunswick, Ohio, assignors to Globe-Union Inc., Milwaukee, Wis.

Filed Jun. 27, 1977, Ser. No. 810,060
Int. Cl.[2] H01H *19/60*
U.S. Cl. 200—6 B **7 Claims**



1. A rotary switch assembly of a plurality of components comprising:

an indexing unit, said unit including a housing supporting therein a movable member rotatable to and between a plurality of indexed positions;

shaft means having opposite ends journaled in opposed walls of said unit housing and operatively engaging said movable member;

knob means adjacent the exterior face of a first of said unit housing end walls and engaging an end of one of said unit shaft ends for rotating said movable member to selected indexed positions;

supporting and stacking means for engaging complementing supporting and stacking means on an adjacent switch assembly component formed on the external face of the other of the unit housing end walls;

at least one rotary switch deck, said switch deck including housing means having side and end walls defining a cavity, each of said deck housing end walls including supporting and stacking means for engaging complementary supporting and stacking means on an adjacent switch assembly component;

a plurality of spaced apart fixed electrically conductive terminals having first extremities extending externally of one of said switch deck housing side walls and having second extremities secured within the deck housing cavity;

a plurality of flexible contact fingers supported by said deck housing within said cavity in a spatially separated relationship to the secured extremities of said electrically conductive terminals, said contact fingers having follower means;

means electrically interconnecting said contact fingers to at least one of said conductive terminals;

aligned journal means in said deck housing end walls;

a rotatable disc including a supporting shaft having opposite ends, said shaft ends being journaled in said deck housing journal means, said disc having planar surfaces normal to the axis of its supporting shaft with the disc positioned adjacent to said contact fingers;

means on said disc for engaging said contact finger follower means to move selected contact fingers into and out of contact with oppositely positioned conductive terminals responsive to rotation of said disc;

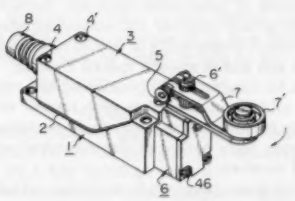
means for rotatably interconnecting opposite switch assembly component shaft ends whereby rotation of the indexing unit knob means to an indexed position results in a concomitant rotation and selective positioning of said disc.

4,133,991

LIMIT SWITCH

Yosio Takase, Sakura, Japan, assignor to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Sep. 27, 1977, Ser. No. 837,036
Claims priority, application Japan, Sep. 27, 1976, 51-116286
Int. Cl.[2] H01H *19/32*
U.S. Cl. 200—47 **4 Claims**



1. A limit switch comprising a housing including a base body and a lid fitted over said base body, a switch unit housed in said housing said switch unit being fixed to said base body and said base body and lid being water-tightly sealed, and a head unit including an actuator, said head unit secured to the base body of the housing, said head unit operatively coupled to said switch unit for converting displacement of said actuator into switch actuating movements, said switch unit being disposed in the housing so as to expose its contactor terminals in open space when said lid is removed, the arrangement being such that side walls of said base body of the housing are formed to be lower at least on the side of leading out wire cords con-

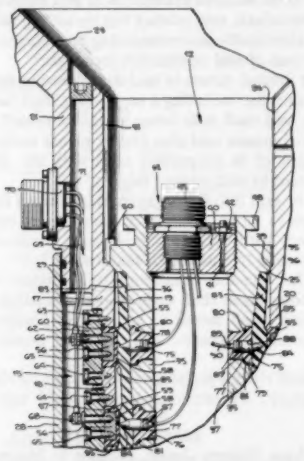
nected to said contactor terminals from the switch unit than the side on which the head unit is coupled to the base body, said body including a projection, said switch unit being secured against movement in one direction by engagement with said projection when said switch unit is installed in said body, said head unit including a mounting part inserted within said body, a resilient member arranged to secure said mounting part within said body while simultaneously exerting forces directed to secure said switch unit against movement in another direction.

4,133,992

SELF-PURGING ELECTRICAL CONNECTOR

Raymond W. Walker, Huntington Beach, and Robert M. Beard, Long Beach, both of Calif., assignors to Compagnie Francaise des Petroles, France

Filed Apr. 11, 1977, Ser. No. 786,210
Int. Cl.[2] H01H *35/24;* H01R *11/02*
U.S. Cl. 200—81 R **15 Claims**



1. An electrical connector comprising:
an elongated receptacle body having a longitudinal axis and a tapered, elongated chamber along said axis,
said chamber having an open end;
an elongated, tapered member receivable through said open end in coaxial relation with said chamber and axis;
a plurality of cooperable electrical contact means on said body in said chamber and on said member,
said contact means being in spaced relation longitudinally of said axis and in angular spaced relation;
means for longitudinally positioning and rotationally orienting said tapered member with respect to said receptacle body for juxtaposing each of said electrical contact means on said body with a mating electrical contact means on said member;
and fluid pressure means for actuating said electrical contact means.

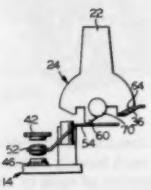
4,133,993

MOMENTARY CONTACT SWITCH WITH COMPENSATING SPRING

Edwin B. Judd, East Greenwich, R.I., assignor to General Electric Company, New York, N.Y.

Filed Jul. 28, 1977, Ser. No. 819,930
Int. Cl.[2] H01H *3/00, 21/04*
U.S. Cl. 200—153 K **5 Claims**

1. A two position center-off momentary contact switch which comprises,
an insulated housing including a base and cover;
three electrical terminals extending through insulating walls of said housing;
a toggle mechanism in said housing having a toggle trigger extending through the cover of said housing;
two spring members in said housing disposed to exert spring bias against portions of said toggle within said housing;
the combined spring bias of said spring members being minimum at the center-off, at rest, position of said toggle;
said two spring members comprising a first spring supported at a fixed end thereof being pre-loaded by bearing against an internal surface of the cover, said first spring contacting the undersurface of the toggle on the at-rest position and all positions clockwise of said at-rest position,



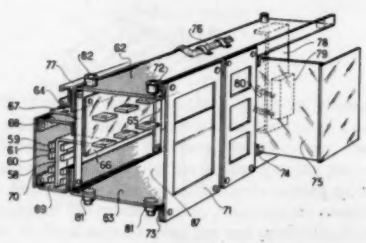
and a second spring supported at a fixed end in the base of the insulating housing and bearing upward against an internal surface of said toggle,
said second spring being a conductive cantilevered leaf spring which is supported at its fixed end from a conductive element electrically connected to a first of the three electrical terminals,
electrical contacts proximate the free end of said second spring for alternate contact with an electrical contact electrically connected to a second of said three electrical terminals and to an electrical contact electrically connected to a third of said three electrical contacts; and
the spring pressure on said toggle increasing as said toggle is moved from said center-off, at rest position.

4,133,994

CELL OF LOW-VOLTAGE FEED AND DISTRIBUTION CELLULAR SWITCHBOARD

Paul Rozier, Chalon sur Saone, and Jean Granson, Saint Quentin, both of France, assignors to Delle-Alsthom S.A., Villeurbanne and Unelec S.A., Paris, both of, France

Continuation of Ser. No. 657,298, Feb. 11, 1976, abandoned.
This application Sep. 20, 1977, Ser. No. 834,884
Claims priority, application France, Feb. 20, 1975, 75 05299
Int. Cl.[2] H01H *9/02*
U.S. Cl. 200—307 **9 Claims**

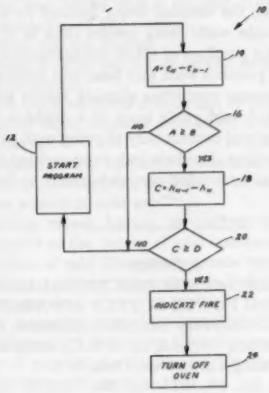


1. A cell of low-voltage supply and distribution cellular switchboard comprising metallic casings stacked one above the other, switching devices enclosed by each of said casings, said metallic casings each comprising: bolted spacing elements, and metallic sheets with venting perforations, said sheets folded and fixed together at intervals by said bolted spacing elements by means of the bolts passing through the venting perforations of said metallic sheets.

4,133,995
METHOD OF FIRE DETECTION IN A MICROWAVE OVEN

Ronald G. Buck, Burnsville, Minn., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Aug. 30, 1977, Ser. No. 829,079
Int. Cl.² H05B 9/06
U.S. Cl. 219—10.55 M **8 Claims**



1. A method of fire detection in a microwave oven comprising the steps of:
   a. comparing a sampled and sensed in-situ temperature with a previous sampled and sensed in-situ temperature of a microwave oven heating cavity;
   b. comparing a sampled and sensed in-situ previous relative humidity with a sampled and sensed in situ relative humidity of said microwave oven heating cavity;
   c. indicating that a fire exists when said sampled and sensed temperature is increasing and said sampled and sensed relative humidity is decreasing, and;
   d. turning off the oven.

4,133,996
MICROWAVE OVEN EGG COOKING APPARATUS

Ronald G. Fread, 10 Davenport Ave., New Rochelle, N.Y. 10805

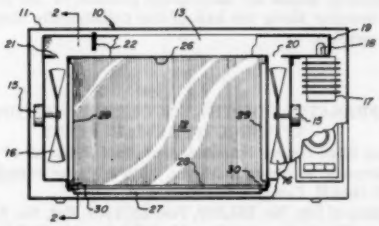
Filed Feb. 15, 1977, Ser. No. 768,856
Int. Cl.² H05B 9/06
U.S. Cl. 219—10.55 M **4 Claims**

1. A method for cooking a raw shelled egg in a microwave oven of the type that is energizable for selectable time periods, said method comprising the steps of:
   a. providing a container having a base portion and a substantially concentric open top portion and comprising microwave transmissible material;
   b. depositing a raw shelled egg in the container;
   c. closing the container with a ventilated cover of microwave transmissible material, received over said open top portion to confine the egg therein;
   d. placing the container in a microwave oven which is energized for a selected time period and distributing the available microwave energy from the energized oven to the yolk and albumin portions of the egg to effect the cooking of both portions to a desired degree of doneness in the selected time period by providing microwave reflective material solely above and beneath the egg by a first shield disposed over the egg and adjacent to the cover and a second shield disposed below the egg and adjacent to said base portion of the container.

4,133,997
DUAL FEED, HORIZONTALLY POLARIZED MICROWAVE OVEN

Richard A. Thuleen, Minneapolis, Minn., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Feb. 9, 1977, Ser. No. 766,854
Int. Cl.² H05B 9/06
U.S. Cl. 219—10.55 F **10 Claims**



1. In a microwave oven for cooking foodstuffs, the oven including a cabinet, a cooking cavity and a microwave energy generator the improvement comprising an elongate waveguide having an end wall, antenna means for introducing the microwave energy output of said generator into said waveguide adjacent said end wal, said waveguide including a plurality of exit ports communicating with energy mixing means, said energy mixing means in turn communicating with said cooking cavity whereby at least a portion of said energy travels an unreflected path having a length equal to at least three guide wavelengths from said antenna means to said cavity.

4,133,998
COOKING MODE SELECTOR FOR CONTINUOUSLY VARYING A MEAN OUTPUT LEVEL OF A MAGNETRON IN A MICROWAVE OVEN

Akira Otani, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 22, 1977, Ser. No. 809,021
Claims priority, application Japan, Jun. 22, 1976, 51-82260[U]; Apr. 1, 1977, 52-37929
Int. Cl.² H05B 9/06
U.S. Cl. 219—10.55 B **6 Claims**

4. A microwave oven comprising a microwave generation means and a variable cooking mode selector for varying a mean output level of said microwave generation means, said variable cooking mode selector comprising:
   a cylindrically shaped cam member having a longer radius section and a shorter radius section, the ratio of the longer radius section to the shorter radius section being gradually

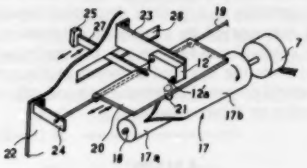
increased along an axis of the cylindrically shaped cam member;

driving means for rotating said cylindrically shaped cam member about said axis;

a contacting member;

means for depressing said contacting member toward said cylindrically shaped cam member so that said contacting member is always brought into contact with the periphery of the cylindrically shaped cam member;

a micro switch through which said microwave generation means is supplied with power;



means disposed between said micro switch and said contacting member so as to close said micro switch when said contacting member is brought into contact with the longer radius section of the cylindrically shaped cam member or to open said switch when said contact member is brought into contact with the shorter radius section of the cylindrically shaped cam member; and

selection means for shifting the location of the contacting member along the axis of the cylindrically shaped cam member.

4,133,999

APPARATUS FOR THE SUCCESSIVE WELDING OF CONSECUTIVE CHAIN LINKS

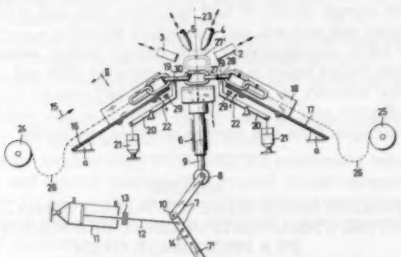
Bruno Ebel; Gunter Krumbolz, and Paul Rahn, all of Cologne, Germany, assignors to Meyer, Roth & Pastor Maschinenfabrik GmbH, Cologne, Germany

Division of Ser. No. 553,039, Feb. 25, 1975, Pat. No. 4,012,618. This application Dec. 10, 1976, Ser. No. 749,519

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1974, 2408971; Dec. 23, 1974, 2461252

Int. Cl.[2] B21L *3/02*

U.S. Cl. 219—51 **24 Claims**



1. In a chain welding apparatus for welding successively the joints of consecutive chain links forming a link chain, the welding apparatus having a welding station including upsetting tools and welding electrodes; a saddle situated in the zone of the welding position for supporting a chain link to be welded; means for vertically moving said saddle upwardly into and downwardly out of said welding position; means for immobilizing said saddle in said welding position; chain guide means including a first and second guide track disposed, respectively, upstream and downstream of said saddle for guiding continuous chain portions to and withdrawing them from said saddle; and first guide track sloping upwardly towards, and said second guide track sloping downwardly from said welding position; each guide track having first and second ends situated respctively adjacent and remote from said welding position; means disposed at said second ends for generating a tension force exerted on said chain substantially parallel to the direction of chain advance; the improvement wherein each said guide track is constituted by a channel at least in the zone of its said first end; the channel being formed by a base and opposite lateral guide walls being spaced such as to constrain the respective chain portions to effect engagement of all chain links of said chain portions with said base; and further wherein said chain guide means comprises aligning means arranged at the first end of each said guide track at a distance from said saddle for engaging and horizontally aligning with one another the chain links flanking the chain link to be welded for orienting the chain link to be welded perpendicularly to the flanking chain links.

4,134,000

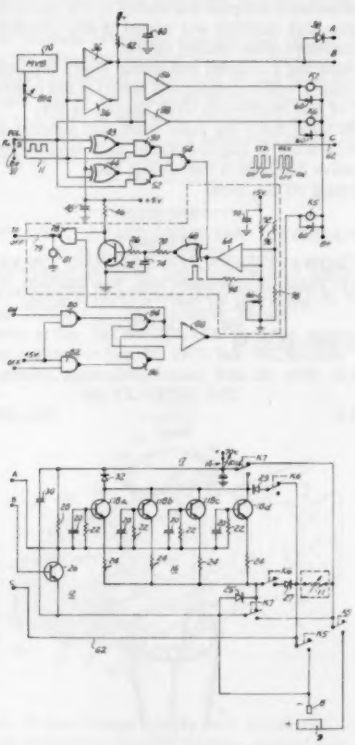
PROTECTION CIRCUIT FOR ELECTRICAL DISCHARGE MACHINING POWER SUPPLY APPARATUS

Oliver A. Bell, Jr., Statesville; Randall C. Gilleland, Troutman, and Jeter O. Barker, Durham, all of N.C., assignors to Colt Industries Operating Corp., New York, N.Y.

Filed Jan. 10, 1977, Ser. No. 757,977

Int. Cl.[2] B23P *1/08*

U.S. Cl. 219—69 C **5 Claims**



1. In an apparatus for machining a conductive workpiece by means of intermittent electrical discharge across an EDM gap between a tool electrode and the workpiece with reversible polarity;

a source of machining power;

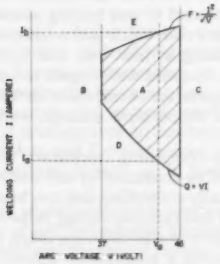
an electronic switch having a pair of power conducting electrodes;
said power conducting electrodes connected between said source and said gap;
a pulser operably associated with said switch for turning it "on" and "off", wherein the improvement comprises a system for cutting off the apparatus in response to failure of said switch comprising;
a sensing lead connecting to the gap for providing a signal representative of gap voltage;
a reference voltage source;
a comparator stage having an output terminal and a pair of input terminals;
one such input terminal connected to the sensing lead and the other input terminal connected to the reference voltage source;
a disconnect means operably connected to said machining power source for interrupting power from said machining power source to said gap;
a switching means having its control electrode operably connected to the output of said comparator for providing operation of said disconnect means responsive to change of said gap voltage below the level of said reference voltage source; and
a gating means connected intermediate said comparator and said disconnect means for allowing passage of either polarity of gap voltage signal, said gating means comprising an exclusive nor gate.

4,134,001

PROCESS FOR WELDING COPPER MATERIALS

Yo Takeuchi, Omiya; Masaki Morikawa, Urawa; Chuji Tanaka, and Toshiharu Hiji, both of Ageo, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Ohtemachi, Japan

Filed Oct. 11, 1977, Ser. No. 841,320
Int. Cl.[2] B23K *9/00*
U.S. Cl. 219—137 R **9 Claims**



1. A process for welding a pair of thick copper plates which comprises welding the pair of copper plates having respective edges placed adjacent to each other on a backing support made of carbon at their adjacent edges in an atmosphere of an inert gas by melting a filler metal with the use of a direct current arc generated between said copper plates connected to the negative pole and a positive electrode, with an arc voltage V (volt) and a current I (ampere) satisfying the conditions:

$$V = 37 \text{ through } 45 \quad (1)$$

$$VI > Q \quad (2)$$

$$I^2/\sqrt{V} < F \quad (3)$$

wherein Q and F are respectively determined from the equations:

$$Q = VaIa \quad (4)$$

$$F = Ib^2/\sqrt{Vb} \quad (5)$$

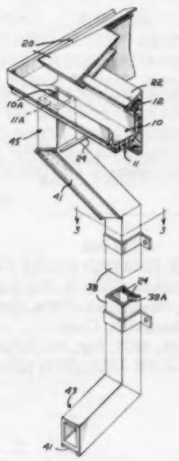
wherein Ia (ampere) is the minimum current at which penetration to the underside of the copper plates is obtained, and Ib (ampere) is the minimum current at which a blow hole is formed in the weld by the decomposition of the backing support at a specific voltage Va within the above stated range (1).

4,134,002

DOWN SPOUTS PROVIDED WITH HEATING ELEMENTS

George H. Stanford, 191 Spurwink Rd., Scarborough, Me. 04074

Continuation of Ser. No. 634,043, Nov. 21, 1975, abandoned, which is a continuation of Ser. No. 469,121, May 13, 1974, abandoned, which is a division of Ser. No. 293,297, Sep. 28, 1972, Pat. No. 3,821,512. This application Jul. 21, 1977, Ser. No. 817,606
Int. Cl.[2] H05B *1/00*
U.S. Cl. 219—213 **5 Claims**



1. A down spout comprising a length of an extruded conduit having a lengthwise passage and a pair of external, integral lengthwise portions transversely spaced to establish an intermediate seat member as a wall of said passage, said portions having lengthwise channels opening towards each other, a backing member substantially coextensive in length with the seat member and dimensioned to fit against said seat with its margins caught by said channels, one of said members having at least one lengthwise groove spaced from said channels, and a heating cable lodged in said groove and held captive between said members, said two members being substantially parallel and substantially in face-to-face contact.

4,134,003

DISHWATER CONTROL

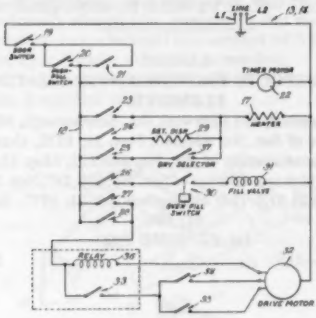
Ronald E. Hahn, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Feb. 16, 1977, Ser. No. 769,037
Int. Cl.[2] H05B *1/02;* B08B *3/02, 3/10*
U.S. Cl. 219—327 **6 Claims**

1. In a dishwasher having operating means utilizing treating liquid for washing dishes in a treating cycle and air for drying dishes in a drying cycle, and electric heater means arranged to heat the dish-treating liquid and to heat the dish drying air, an improved control means for energizing said heater means to heat the treating liquid as an incident of the dishwasher operating in said treating cycle, and selectively (a) causing energizing of said heater means as an incident of the dishwasher operating in said drying cycle, or (b) preventing energizing of said heater

means notwithstanding the dishwasher operating in said drying cycle, said control means comprising:

a first switch for connecting said heater means to a power supply as an incident of the dishwasher operating in said treating cycle;



a second switch in parallel with said first switch for connecting said heater means to the power supply as an incident of the dishwasher operating in said drying cycle; and

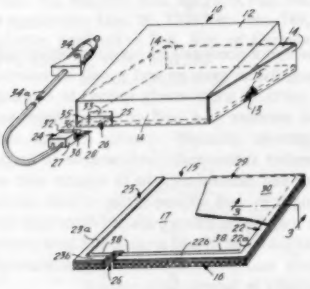
a manually operable control for selectively preventing connecting of the heater means to said power supply by only said second switch.

4,134,004

ELECTRICALLY HEATED PIZZA PACKAGE

Thomas L. Anderson, Neenah; Glenn A. Rasmussen, Ringle, and Gerald J. VanHandel, Neenah, all of Wis., assignors to American Can Company, Greenwich, Conn.

Filed Jul. 18, 1977, Ser. No. 816,444
Int. Cl.[2] A21B 1/52; F27D 11/02
U.S. Cl. 219—387 **3 Claims**



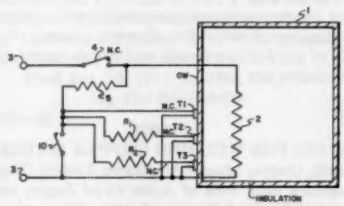
1. In combination: carton structure having at least a bottom wall portion, and a side wall portion extending transversely thereof; means defining an opening in said side wall portion; an electrical heater means extending over said bottom wall portion and including electrical terminal means disposed in registry with said opening and presented for releasable engagement with electrical connector means insertable through said opening to supply electrical energy for said heater means, said heater means comprising an electrically insulative panel including a sheet of corrugated paperboard, a sheet of electrically insulative material comprising glassine laminated to said panel and vacuum metallized with aluminum, and a pair of mutually spaced, elongate electrode means on said metallized sheet and extending along opposed edge portions thereof, said electrode means comprising strips of arc-sprayed zinc on said aluminum, and means providing electrical connection between said electrode means and said electrical terminal means; a pivotal flap on said carton side wall extending partially over said opening; electrical connector means provided with an insulative body portion and contact means thereon, said body portion extending through said opening for engagement of said contact means with said terminal means; and means defining a projection on said body portion disposed for engagement by said flap in a inwardly pivoted postion thereof effected by the extension of said body portion through said opening, said engagement of said projection by said flap being effective forcibly to retain said connector means in said opening in maintenance of the recited contact.

4,134,005

METHOD AND DEVICE FOR CONTROLLING THE TEMPERATURE VARIATION IN A POTTER'S OVEN

Hindrik E. H. Eppens, Groningen, Netherlands, assignor to Keramisch Instituut Haarlem, B.V., Haarlem, Netherlands

Filed Jan. 18, 1977, Ser. No. 760,399
Claims priority, application Netherlands, Feb. 6, 1976, 7601252
Int. Cl.[2] H05B 1/02
U.S. Cl. 219—413 **5 Claims**



1. A potter's oven comprising, in combination:

a housing defining an oven space adapted to receive earthenware which is to be baked;

heating means within said oven space; and

control means connected to said heating means for controlling the temperature to which said oven space is heated;

said housing including at least one wall having an outer surface which is insulated with respect to said oven space whereby the temperature of said outer surface rises slowly and lags behind temperature attained within said oven space;

said control means comprising mechanism which controls the supply of energy consumed by said heating means and means for cyclically controlling said mechanism at at least first and second rates corresponding respectively to first and second temperatures in said oven space, the means last mentioned including a temperature sensor responsive to the temperature of said outer surface to change the cycling of said mechanism from said first rate to said second rate whereby automatically to hold said oven space at said first temperature for that time required for said outer surface to attain said temperature to which said temperature sensor responds.

4,134,006

NAVIGATIONAL WIND EFFECT COMPUTER FOR AIRCRAFT

Willard F. Gordon, 2080 Green Canyon Rd., Fallbrook, Calif. 92028

Filed Apr. 7, 1977, Ser. No. 785,658
Int. Cl.[2] G06C 27/00
U.S. Cl. 235—61 NV **8 Claims**

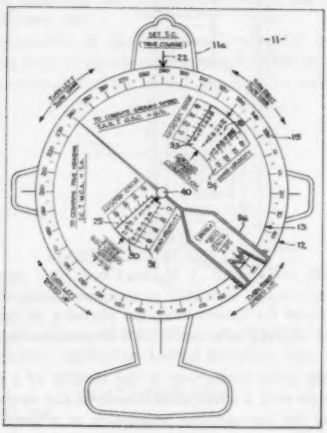
1. A navigational computer for aircraft for computing wind correction angle and ground speed correction comprising:

a first member having a first series of scales representing precomputed ground speed corrections for various combinations of aircraft true course, wind direction and wind velocity for a specified true air speed, said first series of

scales being arranged in a circle around said first member, and forming columns spaced at predetermined angular intervals, and a second series of scales representing wind correction angles computed for various aircraft true courses, wind directions and wind velocities for a specified true air speed similarly circularly spaced around said first member in columns at the same predetermined angular intervals as the first mentioned series of scales, said first member further having indicator means formed at a predetermined position thereon,

a second member placed in concentric relationship with said first member, said second member having compass rose headings represented in a circle running therearound, said second member being rotatably positionable with respect to said first member,

a third member positioned over the second and first members in concentricity therewith and having a first radial window located over the wind correction angle scales and



a second radial window located over the ground speed correction scales, each of said windows having indicia arranged thereon corresponding to wind velocities and located opposite corresponding ones of the scales for wind correction angle and ground speed correction respectively, said third member further being rotatably positionable relative to said first and second members and having indicator means formed at a predetermined position thereon,

whereby said second member is positioned with the indicator means of said first member located opposite a compass rose indication of the second member to represent aircraft true course, and the third member is positioned with the indicator means thereof along the compass rose scale of the second member at a position indicating wind direction, readings of ground speed correction and wind correction angle for various wind velocities being provided on said first member through the windows of said third member.

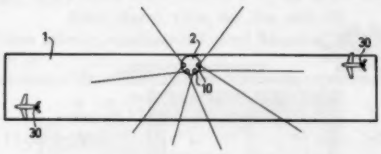
4,134,007

ONE-WAY TRANSMISSION SYSTEM

Wladimir Koreicho, Chilly-Mazarin, and Pierre M. L. Lamelot, Ville D'Avray, both of France, assignors to Societe Anonyme de Telecommunications, Paris, France

Filed May 17, 1977, Ser. No. 797,873
Claims priority, application France, May 21, 1976, 76 15411
Int. Cl.[2] H04B 9/00
U.S. Cl. 250—199 **5 Claims**

1. A system for transmitting alignment data from the turret of an aircraft carrier to aircrafts stationed on the flight deck, comprising: optical transmitters with modulable beams placed on the turret, each of the transmitters comprising a plurality of infrared electroluminescent diodes arranged in a line and means for converting the beams from the diodes into a beam substantially parallel to the flight deck with an angle of sight of a few degrees, the transmitters being arranged in such a manner that the adjacent transmitter beams overlap to a large



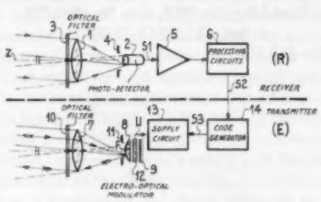
extent; means for modulating the transmitter beam from said data; an optical detector placed on each aircraft, the optical detector being omnidirectional in a plane substantially parallel to the flight deck; and means for demodulating the output signal of said detector.

4,134,008

LIGHT RETRO-REFLECTING RESPONSER AND DATA MODULATOR ARRANGEMENT

Guy de Corlieu; Marcel Malard; Jean-Claude Reymond, and Léon Robin, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 6, 1978, Ser. No. 867,246
Claims priority, application France, Jan. 25, 1977, 77 01990
Int. Cl.[2] H04B 9/00
U.S. Cl. 250—199 **11 Claims**



1. A light retro-reflecting responser and data modulator arrangement intended in particular for producing a transponder in an Identification Friend or Foe system, comprising: reception means for the optical reception, photo-detection and identification of expected incident light radiation, and transmission means for transmitting coded light radiation in response which employ a retro-reflective arrangement comprising an optical objective for focussing the said incident radiation onto a mirror preceded by a lens and an opto-electrical modulator inserted in the optical path near the mirror, the said modulator comprising a plate which receives an electrical control, the said mirror and said modulator being as layers deposited on at least one face of the said lens, and a code generator for generating the said electrical control to provide the said reflected response radiation.

4,134,009

MAGNETIC FOCUSED MICROCHANNEL PLATE IMAGE INTENSIFIER HAVING DYNAMIC RANGE ENHANCEMENT

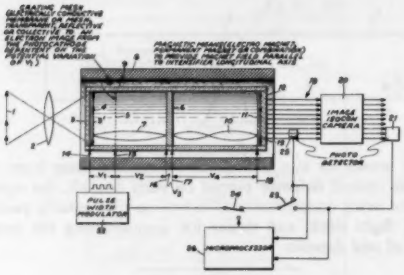
Walter J. Dippold, Pinckney, Mich., assignor to International Telephone & Telegraph Corp., Nutley, N.J.

Filed Jun. 13, 1977, Ser. No. 805,956
Int. Cl.[2] G01J 1/32
U.S. Cl. 250—205 **13 Claims**

1. In a magnetic focused microchannel plate image intensifier including an optically transparent input faceplate, a photocathode in contact with said faceplate, a microchannel plate spaced axially along said intensifier from said photocathode, a phosphor screen disposed adjacent the output of said intensi-

fier and an output window in contact with said screen, an arrangement to enhance the dynamic range of said intensifier comprising:

gating means disposed within said intensifier between said photocathode and said microchannel plate; and



means external of said intensifier coupled to said gating means and disposed adjacent said output window to provide a control signal proportional to light level adjacent said output window to control an electron image from said photocathode by said gating means to achieve enhancement of the dynamic range of said intensifier.

4,134,010

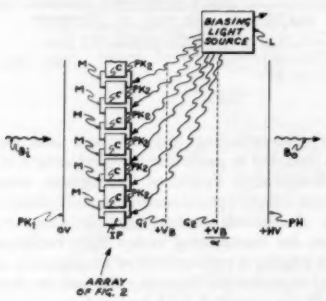
BISTABLE IMAGE TUBE

Edward H. Eberhardt, Fort Wayne, Ind., assignor to International Telephone & Telegraph Corp., Nutley, N.J.

Filed May 26, 1977, Ser. No. 800,771

Int. Cl.[2] H01J *31/50*

U.S. Cl. 250—213 VT **13 Claims**



1. A light responsive bistable image tube comprising:

an elemental portion of said tube including

a first photocathode to receive an element of light input;

a second photocathode spaced from said first photocathode, said second photocathode being coupled to said first photocathode by electrons emitted from said first photocathode;

a first grid adjacent said second photocathode;

a second grip adjacent said first grid remote from said second photocathode; and

an output phosphor screen adjacent said second grid remote from said second photocathode to provide output light; and

a source of biasing light disposed to have said biasing light impinge on said second photocathode to produce no light output on said screen when the brightness of said light input is less than the brightness of said biasing light and to produce a bright light output on said screen when the brightness of said light input is equal to or greater than the brightness of said biasing light.

4,134,011

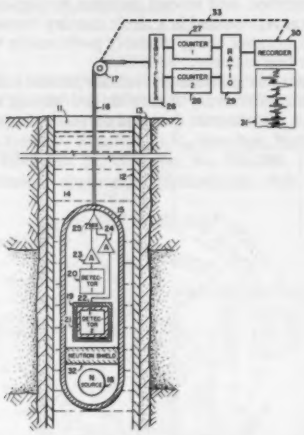
EARTH FORMATION POROSITY LOG USING MEASUREMENT OF FAST NEUTRON ENERGY SPECTRUM

Harry D. Smith, Jr., Houston; Michael P. Smith, Bellaire, and Ward E. Schultz, Houston, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Apr. 20, 1977, Ser. No. 789,058

Int. Cl.[2] G01V *5/00*

U.S. Cl. 250—264 **17 Claims**



1. A method for determining the porosity of earth formations in the vicinity of a cased well borehole comprising the steps of:

irradiating earth formations in the vicinity of a cased well borehole with a continuous source of fast neutrons;

detecting the fast neutron population at a spaced distance from said neutron source in the borehole and generating signals representative thereof;

detecting the epithermal neutron population at a spaced distance from said neutron source in the borehole and generating signals representative thereof; and

combining said fast and epithermal neutron population representative signals to derive a measurement signal functionally related to the porosity of earth formations in the vicinity of the borehole.

4,134,012

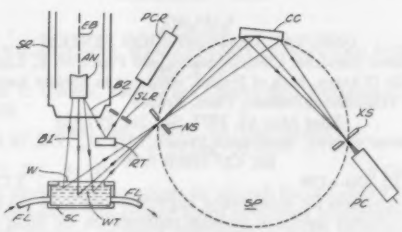
X-RAY ANALYTICAL SYSTEM

Allan H. Smallbone, and Yury M. Gurvich, both of La Crescenta, Calif., assignors to Bausch & Lomb, Inc., Rochester, N.Y.

Filed Oct. 17, 1977, Ser. No. 842,522

Int. Cl.[2] G01N *23/22*

U.S. Cl. 250—272 **22 Claims**



1. In X-ray analytical apparatus for analyzing a sample of

material comprising at least one analyte distributed in a matrix containing solids:

an X-ray source that emits primary X-rays capable of exciting fluorescence in the sample of a first wavelength characteristic of said analyte and that also emits primary X-rays that have second and third wavelengths that are characteristic of the source but not of a component in the sample;

means for exposing the samples to the aforesaid X-rays where fluorescent X-rays characteristic of said analyte are emitted from the sample in an amount dependent primarily upon the concentration of analyte in the sample and secondarily upon the concentration or density of the matrix in the sample and the average particle size of the matrix and whereby X-rays characteristic of said source are scattered by the sample;

means for detecting said fluorescent X-rays and said scattered X-rays; and

means responsive to the detected X-rays for generating different electric signals representative of the intensities of X-rays emitted from the sample at said three wavelengths.

4,134,013

MASS SPECTROMETERS

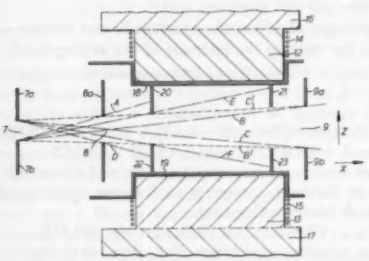
Sydney Evans, Sale, and Leonard J. Rutherford, Davyhulme, both of England, assignors to Scientific Apparatus Limited, England

Filed Dec. 20, 1976, Ser. No. 752,789

Claims priority, application United Kingdom, Dec. 23, 1975, 52574/75

Int. Cl.[2] B01D *59/44*

U.S. Cl. 250—298 **5 Claims**



1. A mass spectrometer including

a magnetic analyser, the magnetic analyser comprising

means defining a collector slit,

a tube for containing an ion beam travelling toward the collector slit,

an electromagnet having pole pieces,

two opposite wall portions of the tube mounted between the pole pieces of the electromagnet with the planes in which the wall portions lie extending substantially perpendicular to the direction of the flux path between the pole pieces,

means defining the beam and

collimating means spaced apart longitudinally of the beam and located adjacent opposite ends of the said wall portions and extending from the wall portions of the tube up to two spaced imaginary surfaces lying transverse to the direction of said flux path and defined by the two opposite edges of the collector slit and two corresponding edges of the beam-defining means.

4,134,014

SPECTROSCOPY

James H. Neave, Horsham, and Michael R. Boudry, London, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

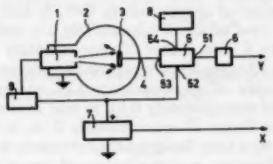
Filed May 9, 1974, Ser. No. 468,278

Claims priority, application United Kingdom, May 23, 1973, 24619/73

The portion of the term of this patent subsequent to Nov. 9, 1994, has been disclaimed.

Int. Cl.[2] H01K *37/26*; H01J *39/00*

U.S. Cl. 250—310 **5 Claims**



1. A method of performing electron spectroscopic surface analysis of a solid material, comprising the steps of directing a primary electron beam from a gun at a surface of a target of said material in a vacuum chamber, said primary electron beam being of energy suitable for the production of Auger electron emission from said target surface, applying an a.c. signal modulated variable retard potential to said target, providing a detector circuit connected to said target, said detector circuit is tuned to measure the second harmonic of the a.c. modulation signal, measuring with said detector circuit a current one separable component of said detector circuit being proportional to the instantaneous net emitted flux of secondary electrons which leave the target as a function of the retard potential, producing with said measured current as a function of the retard potential, an energy spectrum of said secondary electrons characteristic of the target surface and plotting the detector output as a function of the retard potential to produce a spectrum of the first derivative of the secondary electron energy with respect to the retard potential so as to enhance the display of Auger transitions.

4,134,015

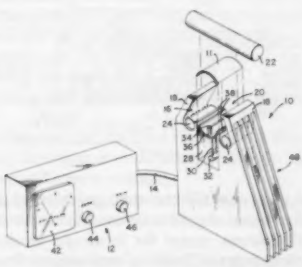
SYSTEM FOR MEASURING THE REFLECTANCE OR EMITTANCE OF AN ARBITRARILY CURVED SURFACE

Charles R. Cunningham, 11148 Rainier Ave. S., Seattle, Wash. 98178

Continuation-in-part of Ser. No. 699,382, Jun. 24, 1976, abandoned. This application May 19, 1977, Ser. No. 798,658

Int. Cl.[2] G01J *1/00*

U.S. Cl. 250—341 **10 Claims**



1. A system for measuring the surface reflectance and emittance on a local region of an object of arbitrary size and shape comprising a measurement head having a radiation enclosure

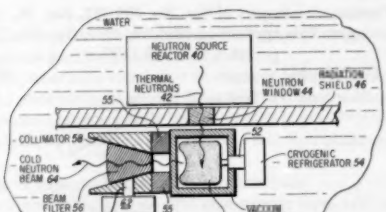
consisting of first and second pairs of spaced sidewalls facing each other; radiation emitting means positioned within said radiation enclosure having an emitting surface; radiation sensing means positioned within said radiation enclosure adjacent said emitting means for generating an electrical signal indicative of the intensity of the radiation incident on a measurement surface; and a measurement aperture formed in said radiation enclosure providing a measurement viewing surface, said viewing surface being in direct view of said measurement surface and said emitting means, said surfaces being related to each other by precisely selected view factor equations such that said emitting means is exposed to itself by a view factor of approximately 0.0, to said first pair of sidewalls by a view factor of approximately 0.32, to said second pair of sidewalls by a view factor of approximately 0.48, to said measurement surface by a view factor of substantially 0.0, and to said viewing surface by a view factor of approximately 0.20; wherein said first pair of sidewalls are exposed to said emitting surface by a view factor of approximately 0.24, to themselves by a view factor of approximately 0.43, to said second pair of sidewalls by view factor of approximately 0.14, to said measurement surface by a view factor of approximately 0.08 and to said viewing surface by a view factor of approximately 0.11; wherein said second pair of sidewalls are exposed to said emitting surface by a view factor of approximately 0.36, to said first pair of sidewalls by a view factor of approximately 0.14, to themselves by a view factor of approximately 0.07, to said measurement surface by a view factor of approximately 0.18, and to said viewing surface by a view factor of approximately 0.25; wherein said measurement surface is exposed to said emitting surface by a view factor of approximately 0.0 to said first pair of sidewalls by a view factor of approximately 0.17, to said second pair of sidewalls by a view factor of approximately 0.36, to itself by a view factor of approximately 0.0, and to said viewing surface by a view factor of approximately 0.47; and wherein said viewing surface is exposed to said emitting surface by a view factor of approximately 0.20, to said first pair of sidewalls by a view factor of approximately 0.15, to said second pair of sidewalls by a view factor of approximately 0.34, to said measurement surface by a view factor of approximately 0.31, and to itself by a view factor of approximately 0.0.

4,134,016

COLD NEUTRON RADIOGRAPHIC APPARATUS AND METHOD

John E. Larsen, La Jolla, Calif., assignor to Helix Technology Corporation, Waltham, Mass.

Filed Apr. 18, 1977, Ser. No. 788,391
Int. Cl.² G01T 3/00
U.S. Cl. 250—392 **15 Claims**



1. In an apparatus for the radiographic examination of a sample with a beam of cold neutrons, said apparatus including a source of neutrons, means for forming a beam of neutrons, means for directing said beam of neutrons to the sample, and means for detecting the attenuation of said beam of neutrons by the sample:

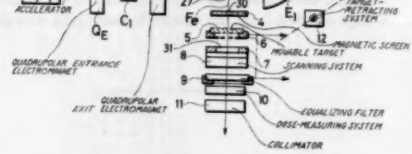
The improvement of providing a moderator material for said neutrons and cryogenic refrigeration means for cooling said moderator material to a range of cryogenic temperatures, whereby the neutrons may be cooled to a temperature matched to the sample to be examined.

4,134,017

RADIATION DEVICE USING A BEAM OF CHARGED PARTICLES

Guy Azam, and Claude Perraudin, both of Buc France, France, assignors to C.G.R.-MeV, Buc France, France

Filed Jul. 5, 1977, Ser. No. 812,734
Claims priority, application France, Jul. 9, 1976, 76 21106
Int. Cl.² H01J 29/00
U.S. Cl. 250—398 **10 Claims**



1. A radiation device comprising:

a source of accelerated charged particles;

focusing means downstream of said source for forming said charged particles into a beam;

guide means defining a predetermined path for said beam, said guide means including first magnetic centering means establishing a rectilinear entrance stretch, second magnetic centering means establishing a rectilinear exit stretch, and a stigmatic and achromatic magnetic deflector establishing a curved path section between said entrance and exit stretches; and

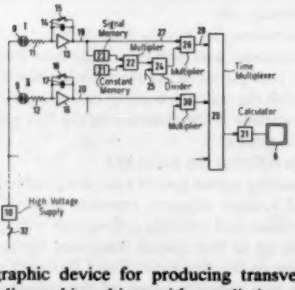
a diaphragm of adjustable aperture in said curved path section for varying the intensity of the exiting beam.

4,134,018

TOMOGRAPHIC APPARATUS FOR PRODUCING TRANSVERSE LAYER IMAGES

Burghard Weinkauf, Erlangen, and Günter Luderer, Eltersdorf, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jun. 24, 1977, Ser. No. 809,806
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1976, 2630399
Int. Cl.² A61B 6/02
U.S. Cl. 250—445 T **3 Claims**



1. A tomographic device for producing transverse layer images of a radiographic subject with a radiation measuring arrangement comprising a radiation source which produces a

radiation beam penetrating the radiographic subject, the extent of which beam in the layer plane is of such dimensions that the entire radiographic subject is penetrated, and also comprising a radiation receiver which determines the intensity of radiation behind the subject by scanning the projected radiation beam, and with rotational movements of the radiation measuring arrangement, and comprising a measured value converter for transforming the signals supplied by the radiation receiver into a layer image, wherein the radiation receiver comprises a row of detectors, the detectors of which having one pole for connection to a common voltage supply, and the number of detectors being selected according to the desired image resolution, and signal processing channels (I, II, etc.,) connected to the respective detectors (8, 9, etc.), means (32) being provided for a short-term change in the voltage connected to the common pole of all the detectors for the calibration (8, 9, etc.), of such signal processing channels.

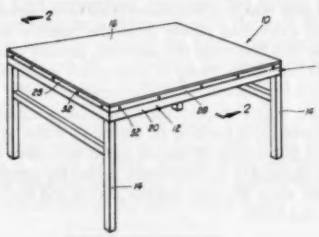
4,134,019
OBJECT SUPPORT SURFACE AND METHOD FOR X-RAY EXAMINATION

Paul G. Koontz, Granada Hills; Richard L. Wright, Canoga Park, and Arthur M. Cantu, Thousand Oaks, all of Calif., assignors to Hipoint Research, Inc., Van Nuys, Calif.

Continuation-in-part of Ser. No. 807,050, Jun. 16, 1977. This application Jul. 22, 1977, Ser. No. 818,135

Int. Cl.² B32B *5/04*; G01N *23/04*

U.S. Cl. 250—439 R **14 Claims**



1. In a support surface attached to a frame for supporting an object to be X-ray examined whereby a source of X-rays and an X-ray image receptor are positioned on opposite sides of said support surface, the improvement comprising:

said support surface being suspended on said frame and being formed of a thin highly X-ray transparent material having a high tensile strength comprised of powdered carbon and a fibrous material selected from the group consisting of carbon filaments, synthetic organic fibers and both carbon filaments and synthetic organic fibers, held in a plastic matrix.

4,134,020
APPARATUS FOR MEASURING LOCAL ABSORPTION DIFFERENCES

Frans W. Zonneveld, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

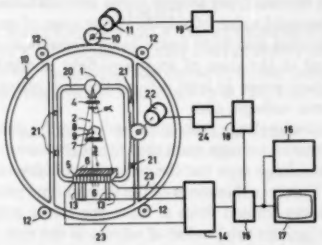
Filed Sep. 26, 1977, Ser. No. 836,684

Claims priority, application Netherlands, Oct. 1, 1976, 7610858

Int. Cl.² G03B *41/16*

U.S. Cl. 250—445 T **6 Claims**

1. Apparatus for determining local absorption differences in a body, comprising a radiation source for generating a fan-shaped beam of penetrating radiation which irradiates the body, detector means which are location-sensitive in at least one direction, scanning means for orbiting said source and detector means about a central axis which passes through said body, the radiation source and the detector means always being situated opposite each other, one on each side of said central axis, and means for adjusting the distance between said central axis and the radiation source and/or the detector means



to which adapt the beam width in the region occupied by the body to a relevant dimension of the body.

4,134,021
METHOD OF CLASSIFYING CHARACTERS HAVING CHARACTERISTICS THAT DIFFER GREATLY FROM STANDARD CHARACTERS

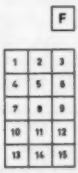
Arthur Klemt, Kochelseestrasse 16, 8031 Grobenzell, Fed. Rep. of Germany

Filed Apr. 21, 1977, Ser. No. 789,365

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1976, 2619245

Int. Cl.² G06K *9/00*

U.S. Cl. 250—567 **5 Claims**



1. In the method of classifying a character having characteristics strongly differing from those of a standard character comprising the steps of projecting the character onto an image field which is divided into imaginary raster areas, generating by means of photo-electric devices a raster area voltage from each raster area and a reference voltage from an area of the background where there is no projected character, subtracting each raster area voltage from said reference voltage to obtain for each raster area a raster area difference voltage, forming linear combinations of said raster area difference voltages to produce output voltages, and comparing said output voltages with a sum raster area difference voltage obtained by summation of the raster area difference voltages to determine whether the output voltage of each said linear combination lies within the limits decisive for the class to be identified, the improvement comprising the steps of:

A. sub-dividing said image field into 9–60 imaginary raster areas;

B. ascertaining, for the standard character of the class to be identified, the raster area difference voltages and the sum raster area difference voltage;

C. forming, from said raster area difference voltages and said sum raster area difference voltage, two types of linear combinations, where

1. the linear combinations of the first type produce output voltages, each of which is formed as a difference of two voltage types respectively, where the first voltage type

a. consists of only one raster area difference voltage, the value of which, in the case of an image field divided into

9–30 raster areas, amounts to at least 2%, and in the case of an image field divided into 30–60 raster areas at least 1.5%, of the sum raster area difference voltage, or

b. is formed from several raster area difference voltages, the total value of which, in the case of an image field divided into 9–30 raster areas amounts to at least 7%, and in the case of an image field divided into 30–60 raster areas, at least 4%, of the sum raster area difference voltage, and

the second voltage type is formed from the sum raster area difference voltage such that it has the same value as the first voltage type but the opposite polarity and

2. the linear combinations of the second type produce output voltages formed from at least one raster area difference voltage, the total value of which, in the case of an image field divided into 9–30 raster areas, amounts to not more than 5%, and, in the case of an image field divided into 30–60 raster areas, to not more than 3%, of the sum raster area difference voltage,

D. ascertaining, for the character to be classified, the raster area difference voltages and the sum raster area difference voltage;

E. forming, from said raster area difference voltages and sum raster area difference voltage associated with the character to be classified, the same linear combinations as those established for the standard character; and

F. ascertaining:

1. whether the output voltage of each linear combination of the first type does not deviate more than ± 30% from the value of the second voltage type, and

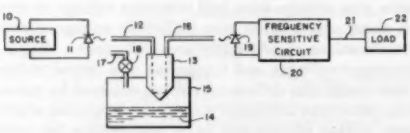
2. whether the output voltage of each linear combination of the second type is less than the sum of (1) 1% of the sum raster area difference voltage and (2) the percentage of the sum raster area difference voltage represented by the sum of the individual raster area difference voltages used in forming the linear combination of the second type in accordance with step C(2) above.

4,134,022

FREQUENCY SENSITIVE LEVEL DETECTING APPARATUS

William F. Jacobsen, Toronto, Canada, assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 25, 1977, Ser. No. 827,493
Claims priority, application Canada, Sep. 3, 1976, 260594
Int. Cl.² G01F *23/00*
U.S. Cl. 250—577 **22 Claims**



1. An apparatus for sensing the level of material comprising:

source means for supplying a signal having a predetermined frequency;

level sensing means having an input connected to said source means and an output for supplying a signal having said predetermined frequency as long as said material is not at a predetermined level;

frequency sensitive means connected to said output of said level sensing means for providing an output when said signal is above said predetermined frequency and an output when said signal is below said predetermined frequency; and,

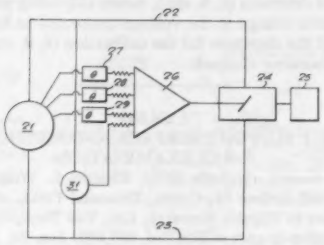
load means connected to said frequency sensitive means for responding to said outputs.

4,134,023

APPARATUS FOR USE IN THE EXTRACTION OF ENERGY FROM WAVES ON WATER

Stephen H. Salter, Edinburgh, Scotland, assignor to The Secretary of State for Energy in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, England

Filed Jan. 14, 1977, Ser. No. 759,274
Claims priority, application United Kingdom, Jan. 20, 1976, 2224/76
Int. Cl.² F03B *13/10*
U.S. Cl. 290—42 **16 Claims**



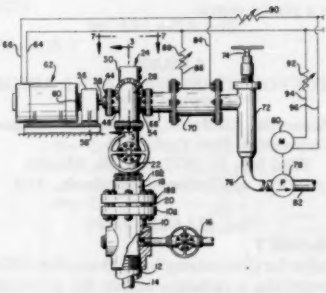
1. Apparatus for extracting power from waves on a water surface, which apparatus comprises a body which in operation is located on or near the water surface so as to be moved by waves, a part which is restrained from being moved by waves, means for extracting power from the relative movement between the said body and the said part, sensing means, sensitive to at least one of the group of parameters comprising displacement position, velocity and acceleration of the said relative movement, where displacement position is measured relative to the equilibrium position of the body when at rest in calm water, for generating an output signal indicative of the said at least one parameter, and feedback means for generating a force dependent upon the said output signal and for applying the force to the body.

4,134,024

METHOD AND APPARATUS FOR GENERATING ELECTRICITY FROM THE FLOW OF FLUID THROUGH A WELL

Ben W. Wiseman, P.O. Box 5394, Midland, Tex. 79701

Filed Sep. 6, 1977, Ser. No. 830,465
Int. Cl.² H02K *7/18*
U.S. Cl. 290—52 **10 Claims**



1. A process for reducing pressure of a fluid producing well by generating electricity comprising the steps of: directing the flow of fluid through a fluid driven motor; connecting the output shaft of the fluid driven motor to an electrical generator; loading the electrical generator to produce a load on the

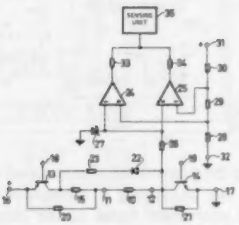
motor; controlling the load on the electrical generator to control the pressure drop across the motor.

4,134,025

ELECTRIC SWITCH ARRANGEMENT FOR USE AS A CURRENT SUPPLY SWITCHING MEANS FOR A BIPOLAR ELECTRIC LOAD

Peter E. Levin, Sundbyberg, Sweden, assignor to K E Levin Maskin AB, Stockholm, Sweden

Filed May 24, 1977, Ser. No. 799,981
Claims priority, application Sweden, Jun. 1, 1976, 7606121
Int. Cl.² H01H *83/00*
U.S. Cl. 307—125 **5 Claims**



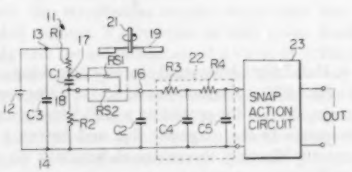
1. An electric switch arrangement for use as a current supply switching means for a bipolar electric load, said arrangement being of the kind comprising two switches which are connected in series with each other and with the load and which are located on opposite sides of the load, characterized by a monitoring equipment for supervising the operation and function of said switches, said monitoring equipment comprising potential generating means for generating at each pole of the load, when both said switches are open, a potential deviating from the potential existing at said each pole when anyone of said switches is closed or both said switches are closed, and sensing means directly connected to said load for sensing the potential of at least one of the poles of the load.

4,134,026

MECHANICAL SWITCH CIRCUIT COMPRISING CONTACT CONDITIONING MEANS

Kiyoshi Sone, and Ichiro Yoshihara, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 7, 1977, Ser. No. 804,343
Claims priority, application Japan, Jun. 11, 1976, 51/67733
Int. Cl.² H01H *9/30, 36/00*
U.S. Cl. 307—137 **14 Claims**



1. A switch circuit comprising:

a D.C. power source having first and second ends;

a first resistor, a second resistor and a first capacitor connected in series across the first and second ends of the power source in such a manner that the capacitor is connected between the first and second resistors;

a second capacitor connected at a second end thereof to the second end of the power source; and

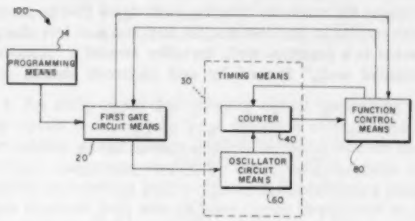
a mechanical switch means for selectively connecting a first end of the second capacitor to first and second ends of the first capacitor which are connected to the first and second resistors respectively.

4,134,027

CONTROL SYSTEM CAPABLE OF ACCOMMODATING A PLURALITY OF MOMENTARY SWITCHING DEVICES

Charles E. Scott, Noblesville, and James E. Small, Indianapolis, both of Ind., assignors to P.R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Jul. 20, 1977, Ser. No. 817,126
Int. Cl.² H01H *43/00*
U.S. Cl. 307—141 **46 Claims**



38. A control system for controlling a machine and the like having at least one cycle made up of at least one event which includes at least two subevents comprising in combination: a power supply source responsive to an alternating reference signal; a control circuit of which only portions are responsive to an electrical signal provided by said power supply source including a plurality of momentarily operable programming means each of which is electrically coupled to ground potential whereby a substantially logical zero signal is provided for actuating said cycle when a programming means is momentarily actuated, gate circuit means for latching said control circuit in at least one mode of operation wherein said event is activated, and timing means responsive to said latching of said gate circuit means for timing said event of said machine in accordance with a selectively programmed time period and for signalling completion of said time period, said gate circuit means latching said control circuit in at least another mode of operation wherein said event is deactivated; and delay timing means electrically coupled to said timing means for administering a sequential activation and deactivation of said two subevents in response to initiation and completion of said time period.

4,134,028

CHARGE TRANSFER CIRCUITS WITH COMPENSATION FOR TRANSFER LOSSES

Walter F. Kosonocky, Skillman, and Donald J. Sauer, Plainsboro, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 7, 1977, Ser. No. 775,408
Int. Cl.² G11C *19/28*; H01L *29/78*
U.S. Cl. 307—221 D **7 Claims**

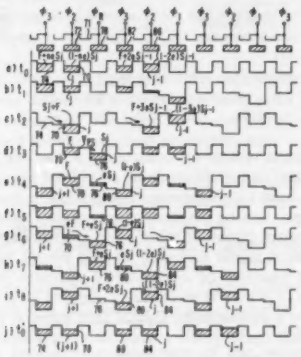
1. A charge-coupled device circuit comprising:

a charge-coupled device (CCD) which includes a semiconductor substrate, a plurality of electrode means insulated from the substrate to which multiple phase voltages may be applied for creating a succession or stream of potential wells in said substrate separated from one another by potential barriers in said substrate, said wells for the storage and propagation in a desired direction, hereafter termed "downstream," of signal charge packets, each such signal charge packet, when propagating downstream from potential well to potential well, suffering a small transfer loss during each such transfer which is manifested as a loss charge and the loss charges derived from each signal charge packet adding to one another to form a sum

loss charge packet which trails the signal charge packet from which it is derived;

said CCD including means for introducing into one potential well in each group of potential wells produced by P adjacent electrode means, a fat zero charge packet, said one well following the one containing the signal charge packet, the sum loss charge packet derived from any signal charge packet combining with the fat zero charge packet following that signal charge packet, where P is an integer equal to at least 3;

said CCD including also after every n of said electrode means a charge combining stage, said combining stage comprising one of said electrode means receptive of a control voltage other than one of said multiple phase voltages for relatively delaying each signal charge packet with respect to its combined fat zero and sum loss charge packet in a potential well, hereafter termed a "summing potential well," formed by said electrode means, and



another of said electrode means for propagating said combined fat zero and sum loss charge packet downstream through a distance such that it combines with the signal charge packet from which the sum loss charge packet was lost, in said summing potential well, to form a reconstituted signal plus fat zero charge packet, where n is equal to at least 50;

said charge combining stage including means responsive to said control voltage for separating said fat zero charge packet from said reconstituted charge packet, at a standard fat zero level and retaining said fat zero charge in a potential well adjacent to and following the one containing the remainder of said reconstituted charge signal packet; and

each said charge combining stage being followed by a plurality of said electrode means to which said multiple-phase voltages are applied for the storage and propagation in said downstream direction of each said reconstituted signal charge packet followed by its fat zero charge packet.

4,134,029

ANALOG SIGNAL DELAY SYSTEM AND METHOD

James A. Bright, Denver, and Gene H. Clark, Englewood, both of Colo., assignors to Hathaway Instruments, Inc., Denver, Colo.

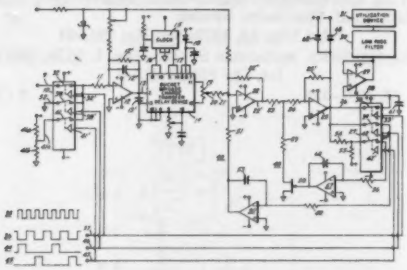
Filed Apr. 29, 1977, Ser. No. 792,219
Int. Cl.[2] G11C *27/02*; H03K *5/13*
U.S. Cl. 307—293 **17 Claims**

1. An analog signal delay system having an analog signal input and a delayed analog signal output and comprising a bucket-brigade charge transfer device having an input and an output and means for producing a predetermined delay between the input and the output, and means for effecting conformation of the delayed output analog signals of said system with the input analog signals supplied thereto, said conformation means comprising:

means for supplying an analog signal,

means for generating a calibration signal,

means for impressing on said device input periodic pulse samples of the analog signal and of the calibration signal in alternating interleaved relationship, and



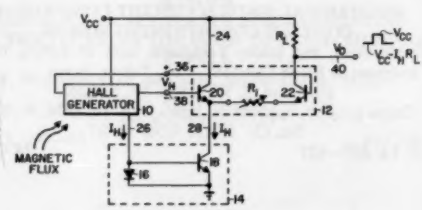
means utilizing the delayed calibration signal at the output of said device for producing a correction signal and for holding the correction signal at the output during the presence of the succeeding delayed analog signal sample regardless of direct current drift during the transfer of the analog signal sample through said device.

4,134,030

HALL-EFFECT INTEGRATED CIRCUIT SWITCH

Wilson D. Pace, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 756,570, Jan. 3, 1977, abandoned. This application Apr. 24, 1978, Ser. No. 899,127
Int. Cl.[2] H03K *17/00*
U.S. Cl. 307—309 **5 Claims**



1. A Hall-Effect integrated circuit comprising:

(a) a Hall-Effect semiconductor device being responsive to a magnetic flux for providing a Hall-Effect output signal in response to the magnetic flux and having a Hall-Effect current flowing therethrough sensitive to temperature variations,

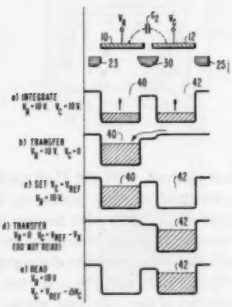
(b) sensing means having a threshold voltage and an operating current coupled to said Hall-Effect device for generating an output voltage at a time when said output signal reaches said threshold voltage, and

(c) means coupled to said Hall-Effect device and to said sensing means for maintaining said operating current at a value which has predetermined relationship to said Hall-Effect current during temperature variations for causing said Hall-Effect output signal to track with said threshold voltage for generating a sensing output signal substantially independent of temperature variations.

4,134,031
CHARGE INJECTION DEVICES AND ARRAYS AND SYSTEMS INCLUDING SUCH DEVICES

Paul K. Weimer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 19, 1977, Ser. No. 834,270
Int. Cl.[2] H03K 3/42; H01L 29/78, 27/14, 31/00
U.S. Cl. 307—311 13 Claims



1. A charge injection device (CID) and a circuit for operating the same comprising:

a semiconductor substrate of given conductivity type;

first and second side-by-side conductors insulated from one another and from the substrate located close to the substrate;

means operative during an integration time for applying a voltage V_R at a given level to said first conductor for producing a first potential well in said substrate beneath said first conductor for the accumulation of charge in response to radiant energy excitation; means operative during said integration time for applying a voltage V_C to said second conductor which can have a value such that a second potential well is produced in the substrate beneath said conductor adjacent to said first potential well, said second potential well for the accumulation of charge in response to radiant energy excitation;

means for creating a potential barrier in said substrate between said potential wells;

means upon the termination of said integration time and while said voltage V_R remains at said given level for operating said second conductor at a value of voltage V_C such that any charge accumulated in said second well passes over said potential barrier and into said first well;

means for then setting and allowing said second conductor to float at a reference level $V_C = V_{REF}$ while said voltage V_R applied to said first conductor is at said given level, both V_{REF} and said given level of V_R being levels such as to produce said first and second potential wells;

means operative while $V_C = V_{REF}$ for then reducing the value of the voltage V_R on said first conductor to a second level such that all the charge present in said first well passes over said barrier to said second well;

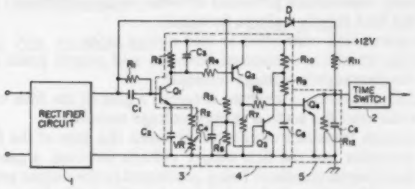
means for returning the voltage V_R on said first conductor to said given level while the charge present in said second well remains in said second well; and

means for then measuring the value of the voltage present on said second conductor.

4,134,032
AUDIO SIGNAL DISCRIMINATOR CIRCUIT

Shizuo Ando, Kawagoe, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 11, 1977, Ser. No. 795,843
Claims priority, application Japan, May 12, 1976, 51-53941
Int. Cl.[2] H03K 5/20
U.S. Cl. 307—351 8 Claims

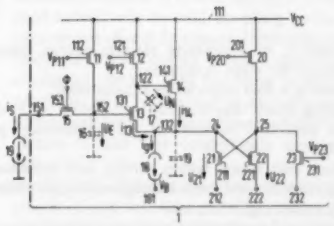


1. An audio signal discriminator circuit comprising a rectifier circuit for rectifying input signals, a voltage hold circuit for holding a peak voltage applied from said rectifier circuit, a voltage comparator circuit for comparing the peak voltage held in said voltage hold circuit with the following peak voltages received from said rectifier circuit to produce an output signal when a following peak voltage is relatively high, a time switch for producing an output signal when no reset signal is applied thereto for a predetermined time period, and a gate circuit for transmitting the output signal of said rectifier circuit as a reset signal to said time switch in response to the absence of an output signal of said voltage comparator circuit, said gate circuit inhibiting the passage of said reset signal upon receiving said output signal.

4,134,033
FAST-SWITCHING DIGITAL DIFFERENTIAL AMPLIFIER SYSTEM FOR CCD ARRANGEMENTS

Kurt Hoffmann, Taufkirchen, and Manfred Mauthe, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jul. 12, 1977, Ser. No. 814,998
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1976, 2631471
Int. Cl.[2] H03K 5/18, 5/02, 17/04; G11C 7/00
U.S. Cl. 307—362 5 Claims



1. A digital differential amplifier for CCD (charge coupled device) arrangements, comprising:

a first transistor connected to an input point, the first transistor being controlled via:

a gate terminal by a first control potential;

a first capacitance provided between the input point and a first supply voltage terminal;

a second transistor having a gate terminal connected to the input point, the second transistor being connected to an output point of the differential amplifier;

a third transistor connected between the second transistor and a second supply voltage terminal, the third transistor

being controlled via a gate terminal by a second control potential;

a second capacitance provided between a junction of the second and third transistors and the first supply voltage terminal;

a fourth transistor having a gate terminal connected to said junction of the second and third transistors, the fourth transistors being connected between the second supply voltage terminal and said output point;

a third capacitance provided between said output point and the first supply voltage terminal;

a current sink connected to said output point;

a fifth transistor connected between said output point and the first supply voltage terminal;

a sixth transistor connected between a gate of the fifth transistor and the second supply voltage terminal;

a seventh transistor connected between the gate of the fifth transistor and the first supply voltage terminal, a gate of the seventh transistor being connected to the output point, the fifth and seventh transistors forming a flip-flop; and

an eighth transistor having a control voltage connected to its gate terminal is connected between a junction of the sixth and seventh transistors and the first supply voltage terminal;

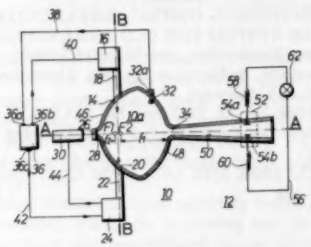
whereby the sixth and eighth transistors activate the flip-flop to hasten discharge of the third capacitance at the output point.

4,134,034

MAGNETOHYDRODYNAMIC POWER SYSTEMS

Pál Dárdai; Ferenc Meckl; József Papp, all of Tatabanya, and Elémer Varga, Budapest, all of Hungary, assignors to Banyaszati Kutato Intezet, Budapest, Hungary

Filed Mar. 9, 1977, Ser. No. 775,996
Int. Cl.[2] H02N *4/02*
U.S. Cl. 310—11 **7 Claims**



1. In a method of generating electric energy magnetohydrodynamically the steps comprising:

a. combusting a fuel material in a combustor;

b. generating shock waves at the termination of the combustion of said fuel material in the combustion products thereof;

c. directing said shock waves within said combustor and guiding them several times through said combustion products by reflecting them; and

d. supplying said combustion products ionized several times by said shock waves into an MHD-generator.

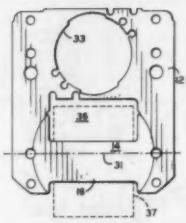
4,134,035

FRACTIONAL HORSEPOWER MOTORS WITH SELECTABLE WINDING WINDOWS

Joe T. Donahoo, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 516,594, Oct. 21, 1974, Pat. No. 3,983,621.
This application Aug. 9, 1976, Ser. No. 712,870
Int. Cl.[2] H02K *15/00, 17/10*
U.S. Cl. 310—42 **6 Claims**

1. A dynamoelectric machine comprising a generally U-shaped core section, and a longitudinally extending coil core having winding turns accommodated thereon; said U-shaped core section and said longitudinally extending coil core both being provided with interlocking means that are symmetrical about a first given longitudinally extending reference line so that the coil core may be assembled with the U-shaped core section in either of two inverted relative positions, and yet so that the interlocking means of the coil core will interface,



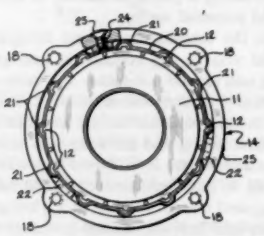
along the entire extent thereof, with the U-shaped core section in both of the two inverted relative positions; the longitudinally extending section of said coil core having winding turns accommodated thereon being asymmetrical relative to the reference line so that a winding accommodating space between the bight of the U-shaped core and the coil core is dependent on the relative orientation of the coil core, about the reference line, to the U-shaped core section.

4,134,036

MOTOR MOUNTING DEVICE

George R. Curtiss, Chardon, Ohio, assignor to Cooper Industries, Inc., Houston, Tex.

Filed Jun. 3, 1977, Ser. No. 803,159
Int. Cl.[2] H02K *15/02*
U.S. Cl. 310—42 **9 Claims**



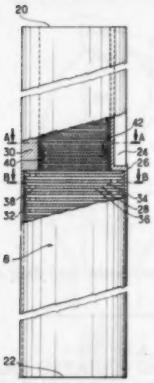
1. A device for securing an electric motor within an outer housing defining at least one radial opening, comprising a longitudinally convoluted annulus substantially equal in length to the stator of the electric motor and having at least one longitudinal plate affixed to the outer surface of said annulus, said plate defining at least one radial opening engageable by a fastener passing through such one opening in such outer housing.

4,134,037

CURRENT LEAD-IN DEVICE FOR SUPERCONDUCTING ROTARY ELECTRICAL MACHINES

Michel Berthet, Gif sur Yvette; Roger Gillet, Belfort; André Marquet, Paris, and François Moisson-Franckhauser, Bretigny sur Orge, all of France, assignors to Alsthom-Atlantique and Electricite de France - Service National, both of Paris, France

Filed Oct. 26, 1977, Ser. No. 846,225
Claims priority, application France, Oct. 28, 1976, 76 32548
Int. Cl.² H02K 9/00
U.S. Cl. 310—52 8 Claims



1. A rotor for superconducting rotary machine comprising:

(a) a superconductive winding subject to high-intensity, variable magnetic fields;

(b) two normal conductors for conveying current to said superconductive winding;

(c) two current leads for effecting the transfer of current between the normal conductors and the superconductive winding, each of the leads having a cold end adjacent the superconductive winding and a hot end adjacent the normal conductor; and

(d) means for introducing a pressurized cooling fluid into the rotor and circulating it over the superconductive winding and the current leads, with the fluid passing from the cold end of said leads to the hot end, the improvement comprising:

(e) each current lead being in the form of a tube of a material which is a good conductor of heat and electricity, a mixed section of the tube extending from the cold end to the hot end thereof and having fastened to it a superconductive conductor in good thermal and electrical contact with the tube, the remainder of which constitutes a "normal" section thereof; and

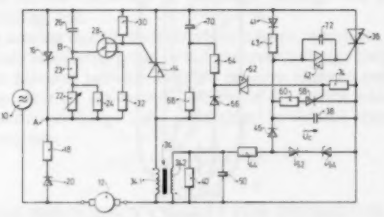
(f) a series of plates contained within the tube and being substantially perpendicular to the tube axis, the plates filling the tube so as to define a series of flat chambers between adjacent plates, each of which comprises a hole enabling the cooling gas to flow from the cold end of the tube to the hot end through the series of chambers, the gas passing from one chamber to the next via the hole in the plate separating the two chambers, a pressure drop occurring as the fluid passes through said hole.

4,134,038

SPEED CONTROL FOR A UNIVERSAL ELECTRIC MOTOR

Wolfgang Kosak, Möglingen; Peter Werner, Stuttgart, both of Germany; Hans Gerber, Luterbach, and Ivan Hidveghy, Zuchwil, both of Switzerland, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 16, 1978, Ser. No. 869,611
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1977, 2702142
Int. Cl.² H02P 5/40
U.S. Cl. 318—245 9 Claims



1. A speed control for a universal a c electric motor comprising:

a first controllable semiconductor device (14) in series with the motor having a control circuit and having a load circuit including inductive coupling means (34) as well as said motor (12);

a first semiconductor threshold switch (28) and also a variable RC network in the control circuit of said first threshold switch, said RC network including a variable resistance (22) for setting the time constant of said control circuit on the input side of said threshold switch (28) and thereby varying the speed of said motor;

a second controllable semiconductor device (36) in parallel with and oppositely poled to said first controllable semiconductor device (14) and having a control circuit coupled inductively by said coupling means (34) with said load circuit of said first controllable semiconductor device (14), said control circuit of said second controllable semiconductor device (36) including a capacitor (38) connected so as to be charged in each a c cycle to a voltage dependent upon the magnitude of current in said load circuit of said first controllable semiconductor device (14), and

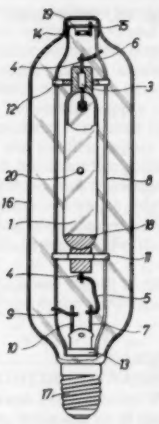
a second semiconductor threshold switch (42) in the control circuit of said second controllable semiconductor device (36) and means (41,43-54) also in said control circuit of said second controllable semiconductor device (36) interconnecting said second semiconductor threshold switch (42) and said capacitor (38) for further charging said capacitor (38), with a predetermined time constant of charging, towards the ignition voltage (U_z) necessary to make said second semiconductor threshold switch (42) conducting, thereby causing said ignition voltage to be reached and said second controllable semiconductor device (36) also to be made conducting at moments the timing of which is dependent upon the magnitude of said current in said load circuit for consequently providing motor speed regulation consistent with a speed setting provided by said variable resistor (22).

4,134,039

HIGH-PRESSURE GAS DISCHARGE LIGHT SOURCE

Denes Vida; Ferenc Nagel; Endre Oldal, and Laszlo Ugrosdy, all of Budapest, Hungary, assignors to Egyesult Izzolampa es Villamossagi Reszvenytarsasag, Budapest, Hungary

Filed Apr. 6, 1977, Ser. No. 785,075
Claims priority, application Hungary, Apr. 7, 1976, EE 2417
Int. Cl.[2] H01J *61/12*
U.S. Cl. 313—229 **18 Claims**



1. A high-pressure gas discharge light source comprising a translucent discharge vessel of high melting point material in which electrodes of high melting point material are suspended, and containing a filling of inert gas, at least one metal halide, the ratio of the metal to the halogen forming the halide being at least stoichiometric, and the specific wall load factor being between 25–200 W/cm^2, and wherein the vessel contains at least one metal in its elemental state under cold conditions.

4,134,040

ADAPTER FOR WIRE ELECTRODE ASSEMBLY OF AN ELECTROSTATIC PRECIPITATOR

Melvin B. Klotzman, Randallstown, Md., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Oct. 19, 1977, Ser. No. 843,633
Int. Cl.[2] H01J *1/94*
U.S. Cl. 313—271 **4 Claims**

1. An adapter for wire electrode assemblies of electrostatic precipitators that enable the use of wire electrodes of the type comprising an elongated electrode wire having its opposite ends terminating axially within shrouds, each shroud shaped as an elongated rod terminating in a combined frusto-cone and enlarged button head, said adapter comprising a piece of metal having in one end thereof a vertically aligned hole that is designed to attach the adapter to a support structure, and in the other end thereof, a horizontally aligned keyhole that is designed to cooperate with the frusto-conical shroud of the wire electrode, the metal being shaped so that the keyhole and hole

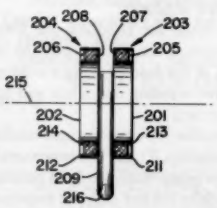
are in planes that are perpendicular and their centers are in the same vertical plane.

4,134,041

GETTER COMPRISING U-SHAPED CHANNEL RING HAVING TWO RING HOLDERS CONTAINING GETTER MATERIAL

Paolo della Porta, and Elio Rabusin, both of Milan, Italy, assignors to S.A.E.S. Getters S.p.A., Milan, Italy

Filed Mar. 4, 1977, Ser. No. 774,426
Claims priority, application Italy, May 12, 1976, 23184 A/76
Int. Cl.[2] H01J *29/84, 31/00*
U.S. Cl. 313—481 **1 Claim**



1. A color television picture tube comprising a glass cone portion, a glass window portion and a metal screening cone said metal screening cone being located within the volume defined by said glass cone portion and said glass window portion, at least a major part of the metal screening cone being distanced away from the glass cone portion, an evaporable getter device being attached to and distanced from the metal screening cone, in which the source of getter material vapours comprises a U-shaped channel ring holder comprising two ring holders for containing evaporable getter material, each ring holder having a base, an inner-wall and an outer-wall, and each ring holder containing evaporable getter material, the bases of the ring holders facing each other and being attached co-axially to two wire supports to make a single getter device, the wire supports having one end bent to form attachment zones for attaching the getter device to the metal screening cone, the

height of the outer-walls and the inner-walls of the ring holders being greater than the height of the evaporable getter material contained therein, the channel ring holder having an axis coinciding with the direction substantially parallel to the surfaces of the glass window portion, the glass cone portion and the metal screening cone.

4,134,042

ELECTRIC DISCHARGE LAMP CONTROL CIRCUIT HAVING A TEMPERATURE DEPENDENT CAPACITOR

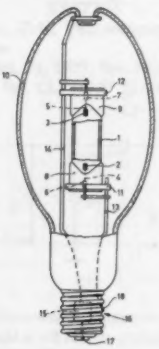
Johan F. T. van Heemskerck Veeckens, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 14, 1977, Ser. No. 833,152

Claims priority, application Netherlands, Sep. 21, 1976, 7610451

Int. Cl.² H01J *7/44, 17/34*

U.S. Cl. 315—59 **6 Claims**



1. Apparatus for operating an electric discharge lamp with alternating current comprising, a pair of input terminals for connection to a source of AC current, said lamp including a discharge tube having at least two main electrodes defining a discharge path and an outer bulb which envelops the discharge tube, a capacitor having a negative temperature coefficient electrically connected to at least one main electrode of the discharge tube and located in heat responsive relationship to the discharge tube, and means connecting said capacitor and the discharge path between the discharge tube main electrodes in series circuit across said pair of input terminals.

4,134,043

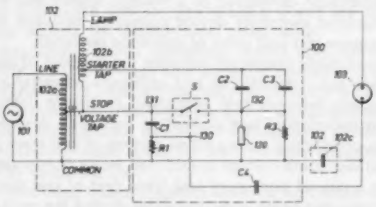
LIGHTING CIRCUITS

Eric L. H. Nuver, Monterrey, Mexico, assignor to Esquire, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 674,447, Apr. 7, 1976, abandoned. This application Aug. 9, 1976, Ser. No. 712,937

Int. Cl.² H05B *41/231, 41/46*

U.S. Cl. 315—92 **123 Claims**



1. In a gaseous-discharge lamp lighting system including a ballast having line and common leads for receiving an AC input voltage, a lamp lead, and a starter winding, and a gaseous-discharge lamp which is operatively connected between the lamp and common leads of the ballast, the improvement comprising:

A starter circuit for generating starting pulses to the gaseous-discharge lamp, which starter circuit comprises:

(a) a first resistive element and a first capacitor operatively connected to form a first series combination, said first series combination operatively connected to the ballast;

(b) a second capacitor and a second resistive element operatively connected to form a second series combination, said second series combination operatively connected to the ballast;

(c) a switch operatively connected in series with the starter winding, said switch and starter winding operatively connected in parallel with the second capacitor, the closing of the switch being determined by the voltage across the first capacitor and the closure of the switch enabling the second capacitor to discharge through the starter winding; and

(d) a sensing circuit, including a reactance, which is operatively connected between the gaseous-discharge lamp and the junction between the first resistive element and first capacitor for preventing closures of the switch when the gaseous-discharge lamp approaches its normal operating condition.

4,134,044

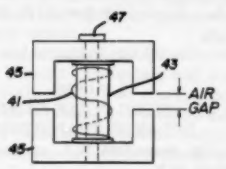
HIGH FREQUENCY CIRCUIT FOR OPERATING A HIGH-INTENSITY GASEOUS DISCHARGE LAMP

Kenneth P. Holmes, Houston, Tex., assignor to Esquire, Inc., New York, N.Y.

Continuation of Ser. No. 654,926, Feb. 2, 1976, abandoned. This application Apr. 20, 1978, Ser. No. 898,309

Int. Cl.² H05B *37/02, 39/04, 41/36*

U.S. Cl. 315—209 R **11 Claims**



1. A high-Q coil for providing high voltage, high frequency operation to a high frequency gaseous-discharge lamp circuit, comprising

a low dielectric loss, low conductivity bobbin, litz wire wound on said bobbin to substantially fill said bobbin,

a matching pair of ferrite core halves supporting said bobbin so as to have an air gap spacing between said halves, said air gap spacing experimentally determined by selecting the highest Q available for the selected pot core by varying the gap spacing for a selected trial number of turns, the number of turns of litz wire being determined by selecting the number thereof for the gap spacing producing the high Q with the selected trial number of turns, and

a low dielectric loss, low conductivity screw for securing said core to said bobbin to thereby create a high-Q coil.

4,134,045

SYSTEM FOR ELECTRICAL INTERCONNECTION AND SWITCHING OF MULTIPLE LIGHTING FIXTURES

Murray L. Quin, Overland, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Continuation of Ser. No. 692,882, Jun. 4, 1976, abandoned. This application Jan. 6, 1978, Ser. No. 867,245

Int. Cl.² H05B *37/00, 39/00, 41/00*

U.S. Cl. 315—324 **10 Claims**

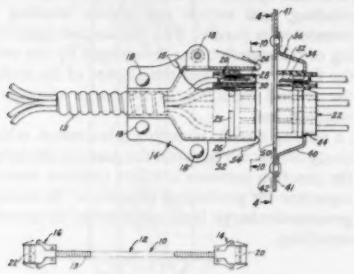
1. The method of electrically interconnecting a plurality of lighting fixtures in succession, which consists in;

extending first, second, and third circuit leads from a power source to the first fixture, through each fixture, and between successive fixtures

connecting all fixture lamps across those portions of the first and third circuit leads extending through the fixtures,

connecting the first and second circuit leads to one side of the power source and the third circuit lead to the other side thereof,

detachably connecting at least one end of said circuit lead portions extending between said fixtures to one end of those portions thereof extending through said fixtures, and in



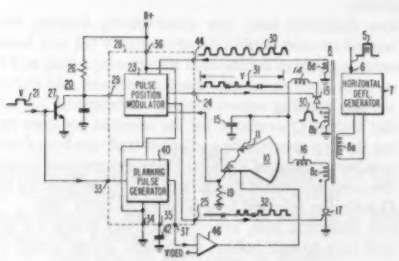
cross-connecting one end of those portions of said first and second circuit lead portions extending between two of said fixtures to one end of those portions thereof extending through one of the said two fixtures so that lamps of fixtures lying between the point of cross-connection and the power source are connected across a first circuit formed by said first and third circuit leads and the lamps of fixtures lying beyond the point of cross-connection are connected across a circuit formed by the second and third circuit leads.

4,134,046

RETRACE BLANKING PULSE GENERATOR WITH DELAYED TRANSITION

Adel A. A. Ahmed, Annandale, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 31, 1977, Ser. No. 829,539
Int. Cl.[2] H01J *29/52*
U.S. Cl. 315—384 **12 Claims**



1. A retrace blanking pulse generator for a television receiver including a kinescope deflection apparatus synchronized from a source of synchronizing signals initiating but preceding a blanking pulse transition, comprising:

a source of operating power;

energy storage means including means for forming a time constant;

switch means, coupled to the source of synchronizing signals, to said source of operating power and to said energy storage means for switching the coupling of said energy storage means to said source of operating power in synchronism with said synchronizing signals;

a source of reference potential;

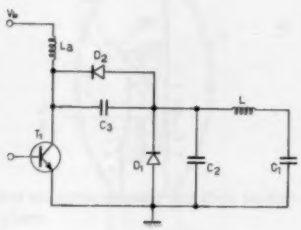
comparator means having a first input coupled to said source of reference potential and a second input coupled to said energy storage means, said comparator being coupled to the output of said blanking pulse generator at which said blanking pulse transition is initiated at a time after said synchronizing signal determined by said time constant.

4,134,047

CIRCUIT FOR GENERATING A SAW-TOOTH CURRENT IN A COIL

Giuseppe Zappala', Turin, Italy, assignor to Indesit Industria Elettrodomestici Italiana S.p.A., Rivalta (Turin), Italy

Filed Jun. 8, 1977, Ser. No. 804,662
Claims priority, application Italy, Jun. 15, 1976, 68468 A/76
Int. Cl.[2] H01J *29/70*
U.S. Cl. 315—408 **6 Claims**



1. In a circuit for obtaining a saw-tooth current in a coil, suitable as a line deflection circuit for a television receiver and comprising:

said coil in which the saw-tooth current is to be generated, said coil having first and second terminals;

a first capacitor having first and second terminals, said first terminal being connected to said first terminal of said coil;

a first diode having first and second terminals, said first terminal being connected to said second terminal of said first capacitor and said second terminal being connected to said second terminal of said coil to form a loop, one of said first and second terminals of said first diode being connected to a reference potential;

a second capacitor having first and second terminals and a capacity much lower than said first capacitor, said first terminal being connected to the common junction point of said first diode and said coil and said second terminal being connected to one of said first and second terminals of said first capacitor to form together with said coil and said first capacitor a resonant circuit such that the voltage on said first capacitor influences the trace part of said saw-tooth current in said coil and the voltage of said second capacitor influences the retrace part of said saw-tooth current in said coil;

an inductance connected to a voltage source and a pulse controlled switching device connected between said inductance and said point of reference potential;

a second diode connected between the terminal of said first diode not connected to said reference potential and the junction between said controlled switching device and said inductance, said controlled switching device being non-conducting during a first portion of said trace part of said saw-tooth current in said coil, being conducting during a second portion of said trace part of said saw-tooth current and being non-conducting during the retrace part of said saw-tooth current;

input energy from said voltage source being supplied to said inductance connected between said source and said controlled switching device and being transferred, during

each retrace part of said saw-tooth current, to said parallel resonant circuit;

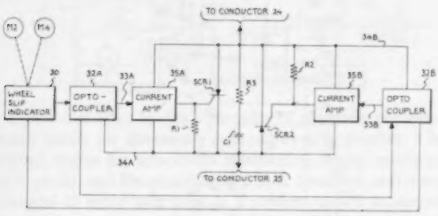
the improvement wherein there is further provided a reactance connected in parallel with said second diode, for transferring energy stored at the end of each trace part of said saw-tooth in magnetic form in said inductance to said parallel resonant circuit during said retrace part of said saw-tooth, said reactance including a capacitor the value of which is such that the resonant circuit formed by this capacitor and said inductance connected between the input source and said controlled switching device has a period which is of the same order as the period of the saw-tooth current generated in said coil, so that by varying the value of said capacitor it is possible to control the transferring of said stored energy.

4,134,048

CONTROL ARRANGEMENTT FOR A WHEEL SLIP SYSTEM

Joseph D. Schneider, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed Oct. 21, 1977, Ser. No. 844,259
Int. Cl.[2] H02P *15/00*
U.S. Cl. 318—52 **5 Claims**



1. In a traction vehicle adapted to be powered from a source of alternating current and including a plurality of direct current electric traction motors each having serially connected armature and field windings, the motors being connected in driving relationship to a corresponding plurality of wheel and axle assemblies of the vehicle, rectifying means interposed between the alternating current source and the traction motors for converting the alternating current to direct current, a current transformer having a primary winding and at least one secondary winding, the primary winding being serially connected between the alternating current source and the rectifying means, means for selectively coupling the secondary winding in current supplying relationship to the field winding of at least a first one of the traction motors for supplying auxiliary current to that field winding during a wheel slip condition of the wheels driven by said first motor, the coupling means comprising auxiliary rectifying means for converting the auxiliary current from alternating current form to direct current form, controllable semiconductor means connected for selectively short-circuiting the transformer, and wheel slip detector means for sensing a wheel slip condition of the wheels driven by said first motor and for producing a wheel slip signal in response thereto, the improvement comprising:

(a) amplifying means connected across said controllable semiconductor means and normally operative when the magnitude of voltage thereacross exceeds a relatively small threshold level to supply gating signals that maintain said semiconductor means in a substantially continuously conducting state whereby said current transformer is short circuited; and

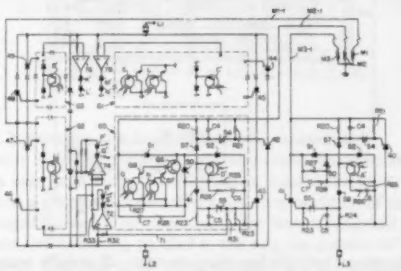
(b) connecting means disposed between said wheel slip detector means and said amplifying means for inhibiting operation of said amplifying means and thereby terminating said gating signals in response to the production of said wheel slip signal, whereupon said controllable semiconductor means reverts to a non-conducting state and auxiliary current flows from said current transformer to the field winding of the motor driving the slipping wheel.

4,134,049

CIRCUIT FOR CONTROLLING SLOW SPEED OF STACKER ELEVATOR MOTOR

Robert B. Gray, Elmira, N.Y., assignor to Hartman Metal Fabricators, Inc., Victor, N.Y.

Filed Mar. 11, 1977, Ser. No. 776,654
Int. Cl.[2] H02P *1/42*
U.S. Cl. 318—756 **10 Claims**



1. Servo apparatus for controlling the direction of rotation of a reversible, polyphase motor, comprising

a first circuit for sensing the polarity of an error signal produced during operation of said motor,

means in said first circuit for producing a first plurality of signals, when said error signal is of one polarity, and for producing a second plurality of signals when said error signal is of the opposite polarity,

a second circuit having a plurality of thyristors between the lines of an AC polyphase power supply and the windings of said polyphase motor,

control means in said second circuit for selectively switching said thyristors between conducting and non-conducting modes, respectively, thereby to control the direction of rotation of said motor, said control means including a first series of control elements operatively coupled to said first circuit and responsive to said first plurality of signals to switch certain of said thyristors to their conducting modes to effect rotation of said motor in one direction,

a second series of control elements operatively coupled to said first circuit and responsive to said second plurality of signals to switch others of said thyristors to their conducting modes to effect rotation of said motor in the opposite direction, and

inhibiting means connected between said first and second series of elements, and the switching thyristors controlled thereby, and responsive directly to the voltage drop across the gate and cathode terminals, respectively, of said thyristors, and indirectly to current flow in said thyristors, to prevent conduction of said certain thyristors when said other thyristors are conducting, and vice versa.

4,134,050

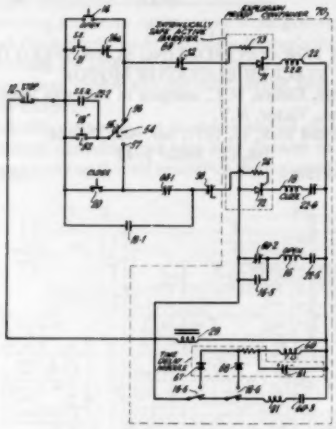
DOOR ACTIVATING MOTOR CONTROL APPARATUS

Dan Sibalis, 90 Gold St., New York, N.Y. 10038

Filed Jan. 25, 1977, Ser. No. 762,271
Int. Cl.[2] H02P *1/08*
U.S. Cl. 318—267 **12 Claims**

1. In combination in door actuating and control apparatus, a safety edge relay coil, an open-direction switch serially connected with said safety edge relay coil, first normally open safety edge relay contacts and safety edge sensor switch means each connected in parallel with said open-direction switch, an open-direction relay coil and second normally open safety edge relay contacts serially connected to said open-direction relay coil for selectively energizing said open-direction coil

when said safety edge relay is actuated, and a close-direction switch, self-latching close-direction relay coil and first normally closed safety edge relay contacts all serially connected for selectively energizing said close-direction coil when said safety edge relay coil is not energized.

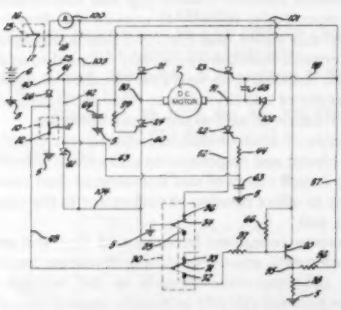


4,134,051

BI-DIRECTIONAL ELECTRIC MOTOR CONTROL CIRCUIT

Paul F. Pelchat, Canton, and Anthony March, Rochester, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 9, 1977, Ser. No. 831,939
Int. Cl.[2] H02P *1/40*
U.S. Cl. 318—282 **3 Claims**



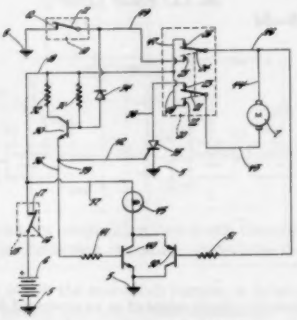
1. An electric motor control circuit for effecting the energization of a controlled bidirectional motor for rotation alternately in opposite directions to operate a movable member to first and second travel limits comprising in combination with a motor and an operating potential source: power switching means of the type electrically operable in a manner to energize said motor for rotation in one direction and in another manner to energize said motor for rotation in the opposite direction; a control switching device that is electrically closed when said movable member is at a first said travel limit; first circuit means including said control switching device connected across said supply potential source and responsive to the operation of said control switching device electrically open for producing an electrical signal effective to operate said power switching means in the manner to energize said motor for rotation in the direction to operate said movable member toward a second said travel limit; second circuit means including said control switching device connected across said supply potential source and responsive to the operation of said control switching device electrically closed when said movable member is at the second said travel limit for producing an electrical signal effective to operate said switching means in the manner to energize said motor for rotation in the direction to operate said movable member toward the first said travel limit; and means effective upon said movable member being operated to either of said travel limits to interrupt motor energization and to condition the circuit for effecting the energization of said motor for rotation in the direction to operate said movable member toward the other said travel limit.

4,134,052

BI-DIRECTIONAL ELECTRIC MOTOR CONTROL CIRCUIT

Bert R. Wanlass, Warren, and Anthony March, Rochester, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 17, 1977, Ser. No. 842,454
Int. Cl.[2] H02P *1/40*
U.S. Cl. 318—282 **5 Claims**



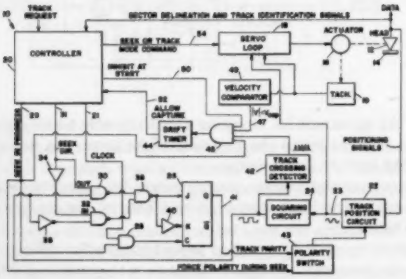
1. An electric motor control circuit for effecting the energization of a controlled bidirectional motor by an operating potential source for armature rotation alternately in opposite directions to operate an electrical motor driven movable member to first and second travel limits, said circuit comprising: electrical switching means operated by said movable member to a first operating condition when said movable member is operated to a first said travel limit and to a second operating condition when said movable member is operated to a second said travel limit, said electrical switching means being effective upon said movable member being operated to either of said travel limits to interrupt motor energization and to condition the circuit for effecting motor energization for armature rotation in the direction to operate said movable member toward the other said travel limit; an electrical switching arrangement of the type capable only of establishing or interrupting one electrical connection that is electrically closed when said movable member is at a first said travel limit; a normally not conductive semiconductor type electrical switching device having at least two current carrying electrodes; circuit means responsive to the operation of said electrical switching arrangement to an electrically open condition for producing an electrical signal effective to operate said semiconductor type electrical switching device conductive through said current carrying electrodes thereof; a first circuit including said electrical switching means and said current carrying electrodes of said semiconductor type electrical switching device that is effective to energize a controlled motor for armature rotation in the direction to operate said movable member toward a second said travel limit in response to the operation of said electrical switching arrangement to a electrically open condition; and a second circuit including said electrical switching means and said electrical switching arrangement that is effective to ener-

gize a controlled motor for armature rotation in the direction to operate said movable member toward the first said travel limit in response to the operation of said electrical switching arrangement to an electrically closed condition.

4,134,053
METHOD AND MEANS FOR CAPTURING MAGNETIC TRACKS

Lance T. Klinger, Playa Del Rey, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 26, 1976, Ser. No. 735,851
Int. Cl.[2] G05B *13/00*
U.S. Cl. 318—561 **2 Claims**



1. In a disc drive having a plurality of generally parallel data tracks which are alternately odd and even in number; a head; control means for selectively establishing a seek mode and a track mode, and for establishing a seek direction; servo means arranged to move said head in a predetermined acceleration-deceleration pattern across a plurality of data tracks during said seek mode, and to cause said head to capture and track the nearest track of appropriate odd or even nature during said track mode; and track position means arranged to produce an output of selectable polarity whose magnitude is representative of the distance of said head from the nearest track center, and whose sign is representative of the direction in which said head is displaced from said track center, of whether the track from whose center said head is displaced is odd or even, and of the selected polarity; apparatus for capturing a data track from a blind seek, comprising:

(a) means for selecting a fixed, predetermined polarity for said track position means output during said seek mode;

(b) velocity sensing and comparing means for detecting the deceleration of said head through a predetermined capture velocity;

(c) track-crossing detection means connected to detect the crossing of a data track center by said head following said deceleration through capture velocity;

(d) means for producing a first signal representative of the direction of said seek;

(e) logic means connected to said track-crossing detection means and said first signal producing means for producing, upon said crossing detection, a second signal representative both of said track position means output following said crossing and of said seek direction;

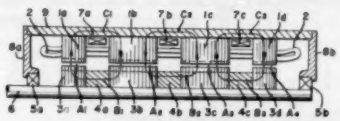
(f) means responsive to said track crossing and said deceleration through capture velocity to cause said control means to establish said track mode following the production of said second signal; and

(g) switching means responsive to said second signal to select the polarity of said tracking means output, whereby said tracking means output will so match the odd or even nature of the next data track being approached by the head as to cause said servo means to perform an optimal capture of that track.

4,134,054
HOMOPOLAR SYNCHRONOUS MACHINE

Masahiko Akamatsu, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 709,272, Aug. 28, 1976, abandoned, which is a continuation-in-part of Ser. No. 511,440, Oct. 2, 1974, abandoned. This application Aug. 22, 1977, Ser. No. 826,716
Int. Cl.[2] H02K *37/00*
U.S. Cl. 318—685 **6 Claims**



1. A homopolar synchronous machine comprising:

a stator including a plurality of stator cores separated along an axis, each stator core having an inner cylindrical surface, a plurality of slots and a plurality of ridges of stator magnetic teeth disposed around the inner cylindrical surface and extending parallel to the axis, the number of said stator magnetic teeth being greater than the number of said slots, each said stator core being formed of a plurality of laminated cores,

a plurality of coils of stator windings contained in said slots, each slot containing a respective coil of said coils of said stator windings;

a rotor including a plurality of rotor cores separated along the axis, each rotor core having an outer cylindrical surface and a plurality of ridges of rotor magnetic teeth disposed around the outer cylindrical surface and extending parallel to the axis, the number of said rotor magnetic teeth in each rotor core being more than the number of said slots in each stator core, each said rotor core being formed of a plurality of laminated cores,

a plurality of rotor magnetic yokes, each rotor magnetic yoke being disposed between a pair of adjacent rotor cores, said rotor magnetic yokes and said rotor cores being disposed around a rotatable shaft,

a field winding including a plurality of field coils, each said field coil being disposed between adjacent stator cores and wound around the ouside of said coils of stator windings and formed in a circular ring,

a barrel-shaped stator magnetic yoke surrounding both said stator cores and said field coils, each said field coil being wound through a space surrounded by said stator magnetic yoke, said stator cores and said coils of stator windings,

a plurality of closed magnetic circuits being formed including said stator cores, said rotor cores, said rotor magnetic yokes and said stator magnetic yoke, radial flux paths crossing the cylindrical air gap between the rotor cores and stator cores, and said field winding generating a field magnetomotive force for feeding magnetic flux to said closed magnetic circuits to impart a homopolar magnetic field in said radial flux paths,

said stator magnetic teeth of each stator core being disposed precisely opposite some of said rotor magnetic teeth of each rotor core at only an even number of parts around said outer surface of each rotor core and facing said inner surface of each stator core, said oppositely disposed parts being separated by an equal angular distance,

the angular pitch of said slots being the same for all stator cores and equal to a first pitch,

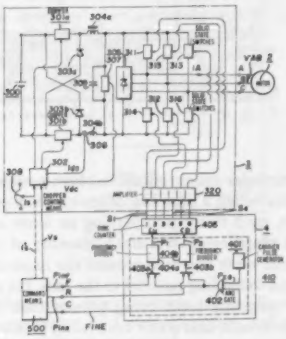
the angular pitch of said stator magnetic teeth being the same for all stator cores and equal to a second pitch, and

the angular pitch of said rotor magnetic teeth being the same for all rotor cores and equal to a third pitch.

4,134,055
INDUCTOR TYPE SYNCHRONOUS MOTOR DRIVING SYSTEM

Masahiko Akamatsu, Amagasaki, Japan, assignor to Mitsubushi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 29, 1976, Ser. No. 671,710
Claims priority, application Japan, Mar. 28, 1975, 50-38110
Int. Cl.[2] H02K 87/00
U.S. Cl. 318—696 9 Claims



1. A fine control system for driving an inductor type synchronous motor comprising:

an inductor type synchronous motor having a first inductor equipped with driving windings corresponding to m phases and a group of first magnetic teeth, and a second inductor equipped with a group of second magnetic teeth, m representing a positive integer;

a DC power supply;

a plurality of switches connected between the DC power supply and the driving windings for distributing the DC power supply voltage to the driving windings of the individual phases;

control means for generating command pulse trains with meaning of positive and negative rotation and fine control mode command pulse trains; and

distribution pattern generator means connected to the control means and responsive to the generating of a fine control mode command pulse train for controlling the on-off operation of the plurality of switches, the distribution pattern generator means comprising:

a carrier pulse train generator;

gate means connected to the control means and to the carrier pulse train generator and responsive to the generating of a fine control mode command pulse train for passing a carrier pulse train;

a first pulse train adder connected to the gate means and to the control means and responsive to the generating of a positive rotation command pulse train for summing the positive rotation command pulse train with a carrier pulse train passed by the gate means;

a second pulse train adder connected to the gate means and the control means and responsive to the generating of a negative rotation command pulse train for summing the negative rotation command pulse train with a carrier pulse train passed by the gate means;

a reversible ring counter having a count-up input and count-down input and connected to the plurality of switches;

a first frequency divider connected between the first pulse train adder and the count-up input of the counter; and

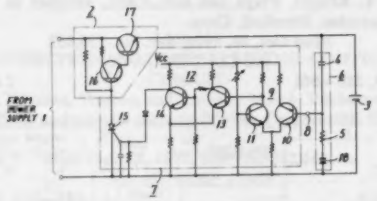
a second frequency divider connected between the second pulse train adder and the count-down input of the counter;

whereby a step number R in excess of 2m per electrical cycle can be obtained.

4,134,056
APPARATUS FOR CHARGING RECHARGEABLE BATTERY

Katsuo Fukui, and Tomio Inoue, both of Sumoto, Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Jan. 5, 1977, Ser. No. 755,823
Claims priority, application Japan, Jun. 16, 1976, 51/71631; Jul. 10, 1976, 51/83277
Int. Cl.[2] H02J 7/04
U.S. Cl. 320—20 20 Claims



1. An apparatus for charging a rechargeable battery adapted to be responsive to a charged state of the battery to stop charging the battery, comprising:

direct current voltage source means for supplying a direct current voltage output to said battery for charging said battery,

means operatively coupled to said battery for diferentiating the terminal voltage of said battery to produce a differentiated voltage output having a characteristic which decreases as a function of time as the battery is charged in which there is a bottom peak followed by a top peak until the battery is fully charged,

means including variable impedance means connected between said direct current voltage source means and said battery and responsive to a differentiated voltage output of said differentiating means of a value less than that of the bottom peak for controlling a charging current to be supplied from said direct current voltage source means to said battery, and

level detecting means coupled to said differentiating means for level detecting the differentiated voltage output at a predetermined level for detecting a charged state of said battery and providing a control signal to said controlling means to change the impedance of said variable impedance means to stop the charging of said battery.

12. An apparatus for charging a rechargeable battery adapted to be responsive to a charged state of the battery to stop charging the battery, comprising:

direct current voltage source means for supplying a direct current voltage output to said battery for charging said battery,

means operatively coupled to said battery for differentiating the terminal voltage of said battery,

means coupled to said battery for sensing its terminal voltage,

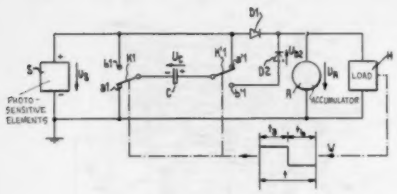
means including variable impedance means connected between said direct current voltage source means and said battery and responsive to a differentiated voltage output of said differentiating means for controlling a charging current to be supplied from said direct current voltage source means to said battery, and

level detecting means coupled to said differentiating means and said battery terminal voltage sensing means for level detecting the difference between the differentiated voltage output and only the sensed battery terminal voltage and at a predetermined level of the difference of the two voltages detecting a charged state of said battery and providing a control signal to said controlling means to change the impedance of said variable impedance means to stop the charging of said battery.

4,134,057
DEVICE FOR ENABLING AN ACCUMULATOR TO BE RECHARGED FROM A SOURCE OF ELECTRICAL ENERGY

Hubert Portmann, Colombier, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland

Filed Nov. 30, 1976, Ser. No. 746,124
Claims priority, application Switzerland, Dec. 10, 1975, 16036/75
Int. Cl.² H02J 7/00; H02M 3/06
U.S. Cl. 320—61 **10 Claims**



1. A device for enabling the recharging of an accumulator having two terminals with a current from a source capable of transforming an incident energy into electrical energy, the source having at least two terminals, said device comprising

diode means directly connected between the source and the accumulator for enabling the recharging of the accumulator directly from the source when the latter exceeds a predetermined value; and

converter circuit means directly connected in parallel with said diode means between the source and the accumulator and comprising,

storage means for storing electrical energy when connected to the source and for providing electrical energy when connected to the accumulator,

a first input terminal,

a second input terminal, said first and second input terminals being directly connected to the terminals of the source,

an output terminal connected to one of the terminals of the accumulator,

switching means capable of being periodically operated for connecting in a first position thereof said input terminals, and hence said source, to said storage means in parallel therewith for the charging of said storage means, and for connecting in a second position of said switching means said charged storage means to said second input terminal and said output terminal, and hence connecting said charged storage means directly in series between the source and the accumulator; said converter means delivering a charging current to the accumulator when the voltage at the output terminal exceeds the voltage of the accumulator; and

said diode means when said switching means is in a first position thereof for preventing a reverse current being delivered to said storage means and the source by the accumulator when the voltage of the accumulator exceeds the voltage of the source.

4,134,058
SELECTIVE DETECTION OF MULTIPLE QUANTUM TRANSITIONS IN NUCLEAR MAGNETIC RESONANCE

Richard R. Ernst, Winterthur, Switzerland, assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Nov. 28, 1977, Ser. No. 855,508
Int. Cl.² G01R 33/08
U.S. Cl. 324—0.5 A **11 Claims**

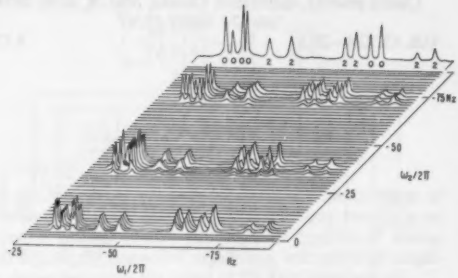
1. In a method of gyromagnetic resonance spectroscopy, performed on a sample comprising systems of gyromagnetic resonators, for selective detection of selected orders of multiple quantum transitions, the steps of

(a) preparing a non-equilibrium statistical state of an assembly of said resonators;

(b) permitting said non-equilibrium state to evolve for a period of time, t_1;

(c) applying a mixing pulse, said mixing pulse being shifted in phase by an angle ϕ with respect to the phase of oscillation characterizing said prepared state of said resonators;

(d) detecting and recording the free induction decay of said resonances over a period of time, t_2, after application of said mixing pulse;



(e) changing said evolution period of time by an increment thereof and repeating steps a–e inclusive, whereby a function s (t_1, t_2, ϕ) is developed;

(f) changing the value of said phase shift and repeating steps a–e inclusive;

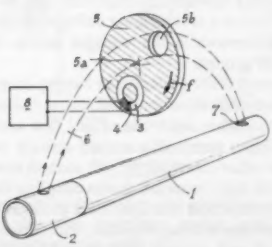
(g) forming a linear combination of recorded free induction decays corresponding to a given value of said first interval of time and different values of said phase shifts; and

(h) double Fourier transforming said linearly combined free induction decays to the frequency domain.

4,134,059
METHOD AND APPARATUS FOR MEASURING THE CORROSION CURRENT OF AN IMMERSED STRUCTURE PROVIDED WITH A CATHODIC PROTECTION DEVICE

Alain Stankoff, Clamart, France, assignor to Societe Intersub Developpement, France

Filed Jun. 7, 1977, Ser. No. 804,315
Claims priority, application France, Jun. 10, 1976, 76 17601
Int. Cl.² G01N 27/42
U.S. Cl. 324—29 **7 Claims**



1. A method of watching over the state of corrosion of an immersed elongated metallic structure provided with cathodic protection means comprising protection anodes, and of watching over the rate of wear of one of said anodes, comprising the steps of measuring the density of direct electrical current at each point along the axis of the structure, and locating a local relative extremum in the current density between adjacent anodes, thereby locating a point of relatively intense corrosion

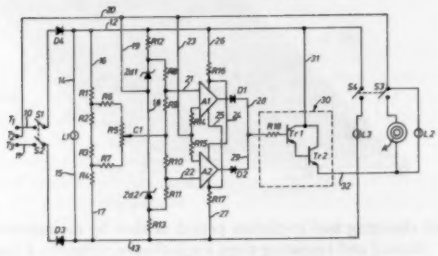
of the structure and deducing by a prior standardization the total current circulating between an anode and the structure.

4,134,060

BATTERY DETERIORATION MONITORING APPARATUS EMPLOYING VOLTAGE COMPARISON MEANS FOR ACTIVATION OF A BATTERY ALARM

Keiva Feldman, Ottawa, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence in Her Majesty's Canadian Government, Ottawa, Canada

Filed Feb. 15, 1977, Ser. No. 768,874
Claims priority, application Canada, Mar. 9, 1976, 247454
Int. Cl.[2] G01N *27/42*
U.S. Cl. 324—29.5 3 Claims



1. Apparatus for continuously monitoring, a battery having a plurality of cells, a first terminal, a second terminal and an intermediate terminal connected between two of said plurality of cells, the voltage between said first and intermediate terminals providing a first input voltage across a first cell group and the voltage between said second and intermediate terminals providing a second input voltage across a second cell group, comprising:

first, second and third input terminals for coupling to said first, second and intermediate terminals of said battery, respectively;

first and second operational amplifiers each having first and second inputs, said second inputs being coupled to said third input terminal,

a plurality of resistors including a tapped rheostat connected across said first and second terminals, the tap on said rheostat being coupled to the first inputs of said first and second operational amplifiers, said rheostat being adjusted when said battery is in good condition for minimum output from said operational amplifiers and to initially balance said first and second input voltages to compensate for normal differences in the voltages across said first and second cell groups,

first and second zener diodes each having an electrode coupled to said third input terminal, a first resistor connected between the other electrode of said first zener diode and said first input terminal, a second resistor connected between the other electrode of said second zener diode and said second input terminal, means coupling the junction of said first resistor and said first zener diode to the first input of said first operational amplifier, and means coupling the junction of said second resistor and said second zener diode to the first input of said second operational amplifier,

alarm means, and

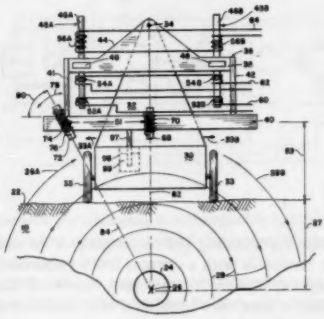
amplifier means coupling said alarm means to the outputs of said operational amplifiers, an imbalance in the voltage applied to said operational amplifiers which exceeds a predetermined threshold value causing one of said operational amplifiers to conduct thereby energizing said alarm means.

4,134,061

PIPE CURRENT DETECTOR WITH PLURAL MAGNETIC FLUX DETECTORS

Howard S. Gudgel, 7326 E. 59 Pl., Tulsa, Okla. 74145

Filed Feb. 2, 1977, Ser. No. 764,727
Int. Cl.[2] G01R *19/14, 31/08;* G01N *27/00*
U.S. Cl. 324—54 9 Claims



1. Apparatus for detecting and determining the amplitude and direction of any electric current that may be flowing axially in a buried pipeline in the earth, at a selected point along said pipeline, comprising:

(a) first and second magnetic flux detectors spaced apart horizontally a selected distance;

(b) said detectors mounted with axes vertical, on a non-magnetic frame, the plane of which is substantially perpendicular to the direction of the pipeline, at a selected distance above the pipeline;

(c) means to position said frame and flux detectors along said pipeline at said selected point with said detectors positioned symmetrically, one on each side of the vertical plane through the pipeline, whereby the vertical component of the earth's magnetic field will be equal, and the same direction, while the magnetic flux due to an axial current in said pipeline will be in opposite directions in each of said two detectors;

(d) means for making a single point measurement by differentially connecting said first and second flux detectors so as to determine the flux through said detectors due to an axial current in said pipeline at said selected point; and including;

(e) vertical third magnetic flux detector means, positioned with its axis midway between said first and second magnetic flux detectors;

(f) fourth magnetic flux detector positioned at a known selected distance horizontally from said third magnetic flux detector, said fourth magnetic flux detector pivoted for rotation about a horizontal axis in said vertical plane perpendicular to said pipeline;

(g) means to rotate said fourth magnetic flux detector means until a minimum flux passes through it; and

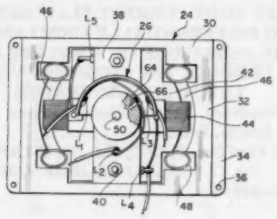
(h) means for determining the angle between the horizontal and the axis of said fourth detector;

whereby the vertical distance between said first and second magnetic flux detectors and the axis of said pipeline can be determined.

4,134,062
LIMITED ROTATION INSTRUMENT REBALANCE APPARATUS EMPLOYING A WIPER HAVING VIBRATION DAMPING

Everett V. Pizzuti, Exeter, and David M. Gaskill, Jr., Providence, both of R.I., assignors to Atlan-Tol Industries, Inc., West Warwick, R.I.

Filed Feb. 28, 1978, Ser. No. 882,287
Int. Cl.[2] G01R *1/14, 17/06*
U.S. Cl. 324—125 10 Claims



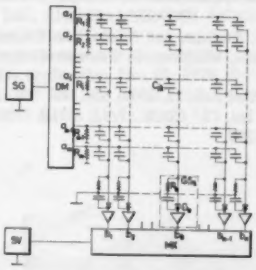
1. A device having a closed loop servo system for indicating the relative strength of an electrical input signal, such system including a limited rotation motor having a permanent magnet and a rotor movable through a magnetic field created thereby, and an electrical winding through which is passed an electrical current thereby creating an opposing magnetic field to change the position of said rotor, means for feeding an input signal to said electrical winding to induce movement in said rotor, transducer means adapted to sense the position of said rotor and to convert said position into an electrical position signal proportional to said rotor position relative to the maximum rotational limits thereof, comparator means for comparing said signals with each other and to correct the position of said rotor and indicating means operatively associated with said rotor to indicate the variations of said corrected input signal, said transducer means comprising a member having an arcuate resistance surface, a spring contact element connected in an acute angular relation to a supporting surface and adapted for relative reciprocal rotation with respect to said resistance surface and electrically connected to said comparator means to close such servo loop, said spring contact element adapted to wipe across said resistance surface upon rotation of said rotor to create said position signal, and a generally non-migratory viscous material in bridging contact with said spring contact element and a portion of the said supporting surface to which said spring contact element is connected for dampening vibration of said spring contact element as it moves across said resistance surface.

4,134,063
APPARATUS FOR THE TIME-DEPENDENT MEASUREMENT OF PHYSICAL QUANTITIES

Klaus Nicol, Adelheidstr. 13,, 6000 Frankfurt, and Ewald M. C. Hennig, Kirleweg 2a, 6454 Bruchköbel, both of Fed. Rep. of Germany

Filed Jun. 29, 1976, Ser. No. 700,905
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1975, 2529475
Int. Cl.[2] G01R *27/26*
U.S. Cl. 324—61 R 4 Claims

1. Apparatus for measuring the values of physical parameters, which comprises a plurality of transducers each operable to sense the value of a corresponding physical parameter to be measured and to establish, when excited, an electrical analog output signal representing the parameter value sensed; a demultiplexer having an input connected to a reference signal source and a plurality of outputs each connected to at least one corresponding transducer to connect same with said source to thereby electrically excite same by said source in sequence to thereby establish the respective output signals of said transducers; a multiplexer having a plurality of inputs each connected to at least one corresponding transducer to receive the output signal thereof, and an output; signal processing means connected to the output of said multiplexer to receive therethrough in sequence the output signals of said transducers and to recover from such signals the parameter value information thereof, said transducers being variable impedance devices in

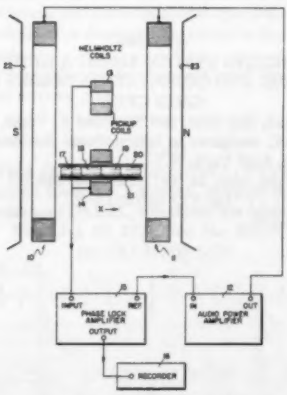


which the impedance varies in accordance with the value of the parameter sensed, and said reference signal source is an alternating voltage source whereby said transducer analog output signals are respective alternating voltages with amplitudes dependent upon the value of the parameter sensed.

4,134,064
METHOD AND APPARATUS FOR MAGNETICALLY DETERMINING THE Gd_2O_3 CONTENT IN UO_2 FUEL PELLETS WHILE ELIMINATING THE EFFECT OF FERROMAGNETIC IMPURITIES

Israel S. Jacobs, Schenectady; Joseph A. Lahut, Scotia, both of N.Y., and Leonard N. Grossman, Wilmington, N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,581
Int. Cl.[2] G01R *33/12*
U.S. Cl. 324—201 13 Claims



1. A method for determining the gadolinia content of fuel pellets which comprise gadolinia, urania, and ferromagnetic inclusions comprising the steps of:

establishing a time invariant magnetic field sufficient to saturate said ferromagnetic inclusion;

superimposing a homogeneous time alternating magnetic field on and substantially coaxial with said time invariant field;

disposing a pair of series opposed pickup coils in said superimposed magnetic fields;

coupling said fuel pellets to one of said pickup coils; and

measuring an ac unbalance voltage induced on said series opposed coils by said fuel pellet; whereby the susceptibil-

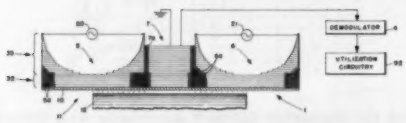
ity of said fuel pellet is measured by an inductive technique and the measurement errors produced by said ferromagnetic inclusions are reduced to a negligible level.

4,134,065

TRANSDUCER FOR DIRECTLY CONVERTING MECHANICAL DISPLACEMENT TO PHASE INFORMATION

Dan O. Bauer, Portage, and Michael A. Pauwels, Kalamazoo, both of Mich., assignors to Pneumo Corporation, Boston, Mass.

Filed Jan. 12, 1977, Ser. No. 758,654
Int. Cl.[2] G01R *33/12*; G01B *7/00*
U.S. Cl. 324—208 **37 Claims**



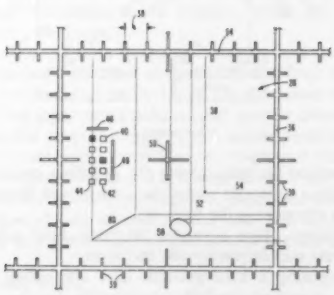
1. A displacement to phase transducor, comprising a plurality of primary means for producing in response to alternating current excitation at different respective phases alternating magnetic fluxes separated by other than zero or one hundred eighty degrees, combining means for combining such plural fluxes to produce an output flux having a phase dependent on those of such plural fluxes and the relative positions of said combining means and said primary means, said primary means and combining means being relatively movable, and output means for producing an output AC electrical signal having a phase corresponding to the phase of such output flux, said primary means comprising two primary electromagnetic coils each including winding means having a non linear distribution of turns which cause the phase of such output flux to vary substantially linearly with respect to relative linear displacement of said combining means and said primary coils.

4,134,066

WAFER INDEXING SYSTEM USING A GRID PATTERN AND CODING AND ORIENTATION MARKS IN EACH GRID CELL

Marcel J. Vogel, San Jose, and Siegfried F. Vogel, Los Gatos, both of Calif., assignors to International Business Machines Corporation, New York, N.Y.

Filed Mar. 24, 1977, Ser. No. 780,877
Int. Cl.[2] G01R *33/00*
U.S. Cl. 324—210 **8 Claims**



1. A wafer assembly for providing a permanent two-dimensional wafer indexing and mapping system comprising

a wafer having a first side and a second side,

a grid pattern engraved into the surface of one side of said wafer, said grid pattern dividing said wafer into a plurality of uniform size cells,

a coding system in said cells engraved into the surface of one side of said wafer which uniquely identifies each cell and defines the exact location of each cell of said wafer, and

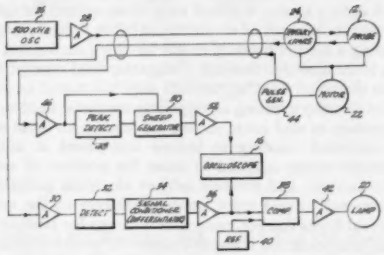
an orientation system including at least two marks of different dimensions for alignment purposes in said cells engraved into the surface of one side of said wafer.

4,134,067

ROTARY EDDY CURRENT FLAW DETECTOR UTILIZING DIFFERENTIALLY UNBALANCED COILS AND THE AMPLITUDE OF A ROTARY INDUCED PULSE TO PRODUCE THE CHARGING VOLTAGE FOR THE SWEEP GENERATOR

Russell K. Woodbury, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 9, 1977, Ser. No. 831,933
Int. Cl.[2] G01R *33/12*; H03K *4/08*
U.S. Cl. 324—219 **6 Claims**



1. Portable eddy current rotary probe type test apparatus for detecting faults in the walls of test holes and the like comprising a test head, including a rotary test probe projecting therefrom and means to rotatively drive said probe, said probe having an end portion insertable in a test hole which end portion includes a transformer primary and two transformer secondaries, including parallel secondary ferromagnetic core elements arranged in a common plane of rotation of the probe and having pole ends facing radially outwardly from the periphery of said probe, said secondaries having a predetermined slight degree of mismatch whereby, with the probe rotating in a test hole and the primary energized by high frequency current, voltages are induced in said secondaries influenced by eddy currents in the hole wall that change by respectively different amounts as such secondaries successively encounter a fault in such wall during each probe rotation cycle, circuit means connecting said secondaries differentially and detecting the composite signal therefrom to produce successive voltage excursions in response to a fault respectively above and below that from the secondaries while they are traversing nonfaulty hole wall regions, means to differentiate said detected composite fault signal so as to produce a monopolarity pulse therefrom at the transition between said excursions, and indicator means responsive to such monopolarity pulse.

4,134,068

TRANSMITTER/RECEIVERS

Christopher K. Richardson, Romsey, England, assignor to Plessey Handel und Investments AG, Zug, Switzerland

Filed Mar. 15, 1977, Ser. No. 777,661
Claims priority, application United Kingdom, Mar. 16, 1976, 10360/76; Oct. 9, 1976, 42065/76
Int. Cl.[2] H04B *7/16, 1/54*
U.S. Cl. 325—7 **17 Claims**

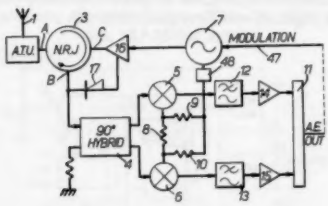
1. A communication transmitter/receiver for contemporaneous transmission and reception, the transmitter/receiver comprising:

an oscillator capable of being angle modulated, said oscillator providing an output signal for transmission;

aerial means for transmitting said oscillator output signal and for accepting a received signal;

first mixing means for mixing said transmission signal from said oscillator with said received signal, said first mixing means having a first input terminal for receiving said transmission signal and a second input terminal for receiving said received signal;

second mixing means for mixing said transmission signal



from said oscillator with said received signal, said second mixing means having a third input terminal for receiving said transmission signal and a fourth input terminal for receiving said received signal;

phase quadrature means arranged so that the signal received at one of said input terminals of said first mixing means is in phase quadrature with the corresponding signal fed to said second mixing means; and

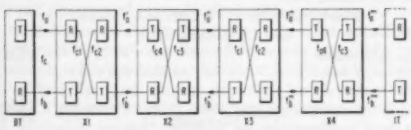
means, directly receiving the output signals from said first and second mixing means, for demodulating said received signal.

4,134,069

SINGLE SIDE BAND MULTIPLEX SIGNAL RADIO RELAY

Haruo Shiki, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 678,528, Apr. 21, 1976, abandoned. This application May 9, 1977, Ser. No. 795,044
Claims priority, application Japan, Apr. 23, 1975, 50-49431
Int. Cl.[2] H04B *7/14*
U.S. Cl. 325—11 **7 Claims**



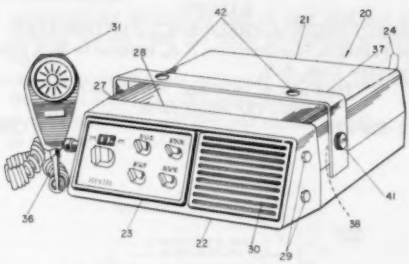
1. In a single sideband multiplex signal radio relay system including a baseband terminal station and a plurality of intermediate repeater stations arranged in an up link or down link, said terminal station and each of said repeater stations having a transmitter and a receiver, and said terminal station being assigned a reference shift frequency fc corresponding to the difference between a transmitting and receiving frequencies the method of reducing interference crosstalk between transmission signals comprising the first step of providing a plurality of first shift frequencies, each first shift frequency corresponding to the difference between the receiving frequency and the transmitting frequency on the up link or the down link at a repeater station, and the second step of selecting in sequence from one intermediate repeater station to another, each of the first shift frequencies from the reference shift frequency fc and any one of a plurality of second shift frequencies deviated from the reference shift frequency according to the relation $fc + n_i \times \Delta f$, wherein n_i is a positive or negative integer and Δf is a radix deviation frequency, whereby the receiving or transmitting frequencies on an up link and a down link at each said repeater station, and the transmitting frequencies and receiving frequencies on the up link and the down link at said repeater stations are made different from each other.

4,134,070

MODULAR RADIO

Claude L. Henderson, Camby, and Edmund L. Abner, Indianapolis, both of Ind., assignors to General Aviation Electronics, Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 784,161, Apr. 4, 1977, abandoned. This application Jan. 19, 1978, Ser. No. 870,678
Int. Cl.[2] H01B *1/38*
U.S. Cl. 325—15 **12 Claims**



1. A radio having operational controls which are able to be oriented in either an upwardly-facing or a downwardly-facing position which comprises:

a main body having means for mounting said main body to a conveyance;

a removable head having an inclined front surface and being attachable to said main body in one of two positions wherein said front surface is inclined upwardly in one position and is inclined downwardly in the other position;

a detachable control plate having a controls side and being attachable to said removable head in one of two orientations wherein said controls side is upwardly facing in one orientation and is downwardly facing in the other orientation; and

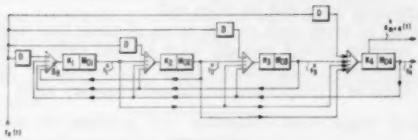
a cable electrically connecting said main body to said detachable control plate.

4,134,071

SSMA DATA TRANSMISSION SYSTEM

Horst Ohnsorge, Erstetten, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Jul. 19, 1971, Ser. No. 164,077
Int. Cl.[2] H04B *1/10*
U.S. Cl. 325—42 **11 Claims**



1. In an SSMA data transmission system in which each binary information signal (k_{ij}), where i and j is equal to 1, 2, 3 . . . , is multiplied with a binary address $a_i(t-j\ T)$ having Z binary digits to form a data function $K_i(t) \cdot a_i(t-jT)$ and is transmitted as a function $f_i(t)$ after being modulated onto a carrier oscillation signal cos ($\omega_i t$), and wherein the m^{th} user station at the receiving end determines the interfered-with received function $K_m^*(t)$ intended for it by correlation of the received total mixture signal $f_e(t)$ with its own carrier modu-

lated address $g^*a_m(t)$, the improvement wherein station m includes means for reproducing the transmitted data-functions $K_i(t)$ by $K_i^*(t)$ of at least one of the stations $i \neq m$ by correlation of the received signal $f_r(t)$ by $g^*a_i(t) = a_i^*(t-jT-\tau_i^*)\cos(\omega_i^* t-\phi_i^*)$ and forming

$$f_i^*(t) = K_i^*(t) \cdot a_i^*(t - jT - \tau_i^*) \cos(\omega_i^* t - \phi_i^*);$$

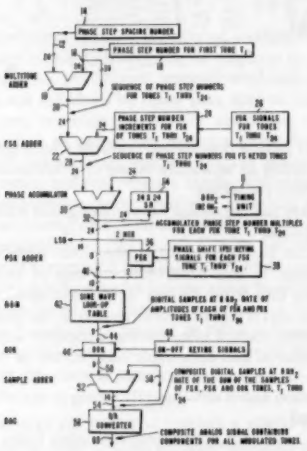
means for subtracting each of the thus reproduced transmitting functions $f_i^*(t)$ from the received mixture signal $f_r(t)$ to produce a derived received signal $f_e^*(t)$; and means for determining the desired data sequence $K_m^*(t)$ by correlating only the signal $f_e^*(t)$ with the address $g^*a_m(t)$ for the m^{th} station.

4,134,072

DIRECT DIGITAL FREQUENCY SYNTHESIZER

Thomas V. Bolger, Merchantville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 6, 1977, Ser. No. 830,857
Int. Cl.[2] H03B *19/00*
U.S. Cl. 328—14 **8 Claims**


PHASE STEP SPACING NUMBER
PHASE STEP NUMBER FOR FIRST TONE T_1
MULTITONE ADDER
SEQUENCE OF PHASE STEP NUMBERS FOR TONES T_1 THRU T_{24}
PHASE STEP NUMBER INCREMENTS FOR FSK OF TONES T_1 THRU T_{24}
FSK SIGNALS FOR TONES T_1 THRU T_{24}
FSK ADDER
SEQUENCE OF PHASE STEP NUMBERS FOR FS KEYED TONES T_1 THRU T_{24}
PHASE ACCUMULATOR
24 BIT 24 BIT
TIMING UNIT
ACCUMULATED PHASE STEP NUMBER MULTIPLES FOR EACH FSK TONE T_1 THRU T_{24}
2 MSB
LSB
PSK
PHASE SHIFT (PS) KEYING SIGNALS FOR EACH FSK TONE T_1 THRU T_{24}
PSK ADDER
SINE WAVE LOOK-UP TABLE
DIGITAL SAMPLES AT 8 KB_2 RATE OF AMPLITUDES OF EACH OF FSK AND PSK TONES T_1 THRU T_{24}
OOK
ON-OFF KEYING SIGNALS
SAMPLE ADDER
COMPOSITE DIGITAL SAMPLES AT 8 KB_2 RATE OF THE SUM OF THE SAMPLES OF FSK, PSK AND OOK TONES, T_1 THRU T_{24}
D/A CONVERTER
COMPOSITE ANALOG SIGNAL CONTAINING COMPONENTS FOR ALL MODULATED TONES

1. A direct digital frequency synthesizer, comprising

means for generating a plurality of time-division-multiplexed phase step numbers corresponding with a respective plurality of frequency tones,

means for altering said phase step numbers corresponding with said tones in accordance with respective modulation signals,

an accumulator for translating each of said altered phase step numbers to a series of accumulated phase step multiple numbers,

a periodic wave look-up table, and

means to apply each of said series of phase step multiple numbers to said periodic wave look-up table to derive time-division-multiplexed digital samples of the amplitudes of corresponding modulated frequency tones.

4,134,073

CLOCK SYSTEM HAVING ADAPTIVE SYNCHRONIZATION FEATURE

William W. MacGregor, Wellesley, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jul. 12, 1976, Ser. No. 704,219
Int. Cl.[2] H03K *1/17, 5/159*
U.S. Cl. 328—63 **10 Claims**

1. A clock system comprising:

A. delay means having a delay period, said delay means having an input and an output;

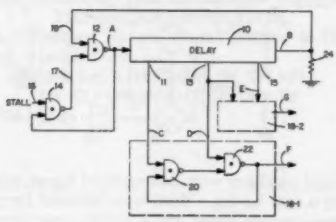
B. means, including said delay means, for generating a clock cycle which is at least two said delay periods in duration;

C. logic means, coupled with said delay means, for producing a clock pulse during said clock cycle, said clock pulse having a duration which is less than that of said clock cycle;

D. gate means having a control input, said gate means comprising

1. first and second gate elements, each having first and second inputs and an output, wherein the first input of said second gate element is said control input,

2. means for coupling the output of said delay means to the first input of said first gate element,



3. means for coupling the input of said delay means and the output of said first gate element to the second input of said second gate element, and

4. means for coupling the output of said second gate element to the second input of said first gate element; and

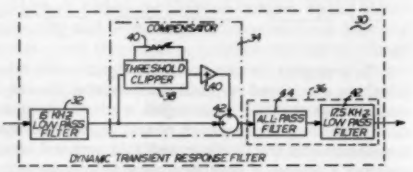
E. means for receiving a control signal at said control input of said gate means, said control signal having either a first level or a second level, said first level operative to enable said clock system to generate said clock cycle and said second level operative to disable said system from generating said clock cycle, whereby said clock cycle is initiated in a minimum period of time following the transition of said control signal from said second level to said first level.

4,134,074

DYNAMIC TRANSIENT RESPONSE FILTER

David L. Hershberger, Quincy, Ill., assignor to Harris Corporation, Cleveland, Ohio

Filed Mar. 25, 1977, Ser. No. 781,159
Int. Cl.[2] H03K *5/08*
U.S. Cl. 328—169 **7 Claims**



1. Apparatus for frequency limiting an amplitude limited signal without exceedng predetermined amplitude constraints, comprising:

first filter means responsive to said amplitude limited signal for providing a frequency limited signal having an amplitude which may overshoot said amplitude constraints;

compensator means responsive to amplitude overshoot of said frequency limited signal for modifying said frequency limited signal so as to substantially avert overshoot of a subsequent filter means which is responsive to the modified signal; and,

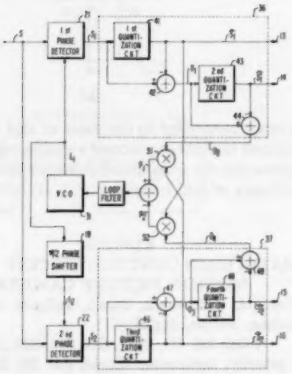
second filter means responsive to said modified signal for frequency limiting said signal to provide a frequency

limited signal having an amplitude which substantially does not exceed said predetermined amplitude constraints.

4,134,075
AMPLITUDE-AND-PHASE DEMODULATOR COMPRISING A QUANTIZATION CIRCUIT

Makoto Washio, Yokohama, and Tadao Shimamura, Tokyo, both of Japan, assignors to Nippon Telegraph & Telephone Public Corporation and Nippon Electric Co., Ltd., both of Tokyo, Japan

Filed Dec. 29, 1977, Ser. No. 865,548
Claims priority, application Japan, Dec. 29, 1976, 51-160726
Int. Cl.[2] H03D *3/00*
U.S. Cl. 329—135 **4 Claims**



1. A demodulator for deriving demodulated signals from an input signal of input levels and input phases subjected to amplitude-and-phase modulation, comprising variable frequency means responsive to a control signal for producing a first reference carrier signal of a frequency and a first phase dependent on said control signal and a second reference carrier signal of said frequency and a second phase having a quadrature phase difference relative to said first phase, first coherent detection means responsive to said first reference carrier signal for detecting said input signals to produce a first detection signal of a first detection level dependent on said input levels and input phases, and second coherent detection means responsive to said second reference carrier signal for detecting said input signals to produce a second detection signal of a second detection level dependent on said input levels and input phases, each of said first and second detection levels being variable between a predetermined highest and a predetermined lowest level, inclusive, on both sides of an intermediate level preselected between said highest and lowest levels, wherein the improvement comprises:

first means responsive to at least one reference level comprising said intermediate level and to said first detection signal for producing a first quantized signal, a first coded signal, and a first quantization error signal, said first quantized signal having one of a plurality of quantization levels predetermined between said highest and lowest levels that is determined by said first detection level to be equal thereto with a first minimum difference, said first side signal being representative of a first and a second predetermined value when said first detection level is between said highest and intermediate levels and between said intermediate and lowest levels, respectively, said first quantization error signal being representative of said first difference;

second means responsive to said at least one reference level and to said second detection signal for producing a second quantized signal, a second coded signal, and a second quantization error signal, said second quantized signal having one of said quantization levels that is determined by said second detection level to be equal thereto with a second minimum difference, said second coded signal being representative of said first and second predetermined values when said second detection level is between said highest and intermediate levels and between said intermediate and lowest levels, respectively, said second quantization error signal being representative of said second difference;

a first multiplier for multiplying said first quantization error signal by second coded signal to produce a first product signal;

a second multiplier for multiplying said second quantization error signal by said first coded signal to produce a second product signal;

a subtractor for subtracting one of said first and second product signals from the other to produce a difference signal;

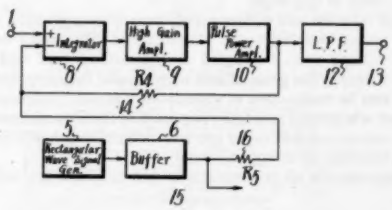
means for supplying said difference signal to said variable frequency means as said control signal; and,

means for producing said first and second quantized signals as said demodulated signals.

4,134,076
PULSE WIDTH MODULATED SIGNAL AMPLIFIER

Tadao Suzuki, and Takeshi Fukami, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 2, 1977, Ser. No. 857,176
Claims priority, application Japan, Dec. 6, 1976, 51-146325
Int. Cl.[2] H03F *3/38, 3/183*
U.S. Cl. 330—10 **10 Claims**



1. A pulse width modulated signal amplifier comprising:

an input terminal for receiving a modulating signal;

means for providing a rectangular wave signal as a carrier;

integrating means having a non-converted input, an inverted input and an output, said non-inverted input being connected to said input terminal to receive said modulating signal;

means for applying said rectangular wave signal to said inverted input of the integrating means;

amplifying means connected with said output of the integrating means for providing an amplified pulse width modulated signal output;

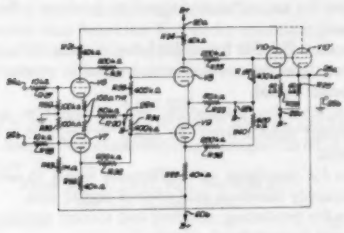
a low pass filter receiving said output of the amplifying means for providing an amplified demodulated signal corresponding to said modulating signal applied to said input terminal; and

a negative feedback circuit for applying a part of said output of the amplifying means to inverted input of the integrating means.

4,134,077
AMPLIFIER CIRCUIT OPERABLE OVER A WIDE TEMPERATURE RANGE

Ronald D. Kelly, San Pedro, and William L. Cannon, Encino, both of Calif., assignors to System Development Corporation, Santa Monica, Calif.

Filed Oct. 20, 1977, Ser. No. 843,710
Int. Cl.² H03F 3/45
U.S. Cl. 330—69 **2 Claims**



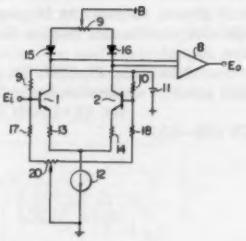
1. An amplifier circuit having relatively stable characteristics over a wide temperature range up to several hundred degrees centigrade, said amplifier comprising:
- at least two cascaded dual differential amplifier stages employing ceramic vacuum tubes;
- a cathode follower output stage also employing a ceramic vacuum tube;
- resistor means for directly coupling said amplifier stages and for appropriately biasing the electrodes of said tubes;
- a common power supply coupled to said vacuum tubes; and
- input circuit means connected to couple an input signal to a first of said dual differential amplifier stages in such a manner that a variation in the magnitude of the input signal results in corresponding variations in current through the tubes of said first stage, and such that the currents in said tubes vary in opposite directions;
- wherein each of said dual differential amplifier stages has a common cathode resistor across which there is essentially zero voltage drop due to signal currents through the two tubes of the stage;
- and wherein said power supply comprises a positive voltage source coupled to the plates of said tubes and a negative voltage source coupled to the cathodes of said tubes, whereby the grids of said tubes in said first amplifier stage can be maintained at substantially ground potential;
- and wherein all resistors connected in the cathode and anode circuits of said tubes are wire-wound and heattreated for stability up to approximately 500° C.;
- and wherein all connections in said amplifier are welded.

4,134,078
GAIN CONTROL CIRCUIT

Takao Arai; Shigeru Okada, both of Yokohama; Kouichi Tomatsuri, and Hiroshi Toeda, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 9, 1977, Ser. No. 823,198
Claims priority, application Japan, Aug. 11, 1976, 51-94883
Int. Cl.² H03G 3/30
U.S. Cl. 330—254 **4 Claims**

1. A gain control circuit comprising:
- a pair of transistors constituting a differential amplifier;
- a pair of resistors each connected at one end thereof to an emitter of one of said transistors said resistors having a large resistance value compared with 1/gm of the transistor in a transistor operating range;
- a regulated current supply connected at one terminal thereof to the other ends of said resistor pair for supplying a regulated control current to said transistor pair through said resistor pair;
- a pair of semiconductor elements each connected at one electrode thereof to a collector of one of said transistors and controlled in resistance with the regulated control current from said regulated current supply;
- a first variable resistor means connected between said semiconductor elements and a power supply for compensating for unbalanced components of DC resistance of said semiconductor elements; and

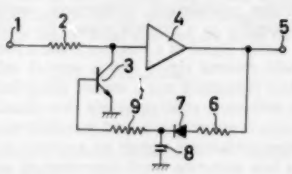


- a bias circuit connected to the bases of said transistors, said bias circuit including a second variable resistor means for compensating for unbalanced components of base-to-emitter voltages of said transistors.

4,134,079
AUTOMATIC GAIN CONTROL CIRCUIT FOR SOUND MOTION PICTURE CAMERA

Yutaka Kohtani, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 29, 1977, Ser. No. 820,259
Claims priority, application Japan, Jul. 30, 1976, 51-91097
Int. Cl.² H03G 3/30
U.S. Cl. 330—281 **16 Claims**

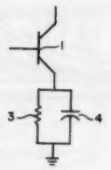


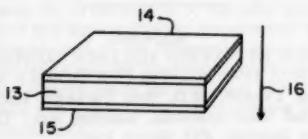
1. An automatic gain control circuit for a camera which records sound with picture comprising:
- (a) amplifier means for amplifying a received sound;
- (b) a first time constant circuit including a first capacitor connected to the output terminal of said amplifier means, wherein said first time constant circuit forms a charge path of said first capacitor for determining a first attack time;
- (c) a first time constant element connected to said first capacitor for forming a discharge path of said first capacitor, wherein said first time constant element determines a first recovery time;
- (d) a second time constant circuit including a second capacitor connected to the output terminal of said amplifier, wherein said second time constant circuit forms a charge path of said second capacitor for determining a second attack time;
- (e) a second time constant element connected to said second capacitor for forming a discharge path of said second capacitor, wherein said second time constant element determines a second recovery time; and
- (f) variable impedance means connected to said first and said second time constant elements to vary said impedance as a function of the outputs of said capacitors for controlling the gain of said amplifier means corresponding to the impedance value of said variable impedance means.

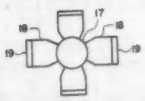
4,134,080
LOW INDUCTANCE RESISTOR

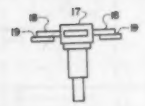
Charles R. Gentzler, South Pasadena, Calif., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Oct. 27, 1977, Ser. No. 846,113
Int. Cl.[2] H03F *3/14*
U.S. Cl. 330—307 2 Claims









1. A transistor power amplifier stage employing a transistor with an external tab type emitter lead characterized in that said stage includes an external emitter stabilization resistor formed of a planar silicon wafer not exceeding 0.1 inches in thickness and containing metalization on both planar surfaces, said wafer being cut to approximately the size of the emitter tab with one planar surface of said resistor being aligned with and connected to said emitter tab to cause the emitter current from the tab to flow through the emitter resistor generally perpendicular to the planar surface of the resistor to the electrical circuit of the amplifier stage.

4,134,081
CLOCK CIRCUIT FOR USE IN PULSE-ECHO ULTRASONIC DEFECT TESTING

Richard J. Pittaro, Stamford, Conn., assignor to Krautkramer-Branson, Incorporated, Stratford, Conn.

Division of Ser. No. 764,343, Jan. 31, 1977, Pat. No. 4,064,742.
This application Oct. 19, 1977, Ser. No. 843,451
Int. Cl.[2] H03B *3/04*
U.S. Cl. 331—1 A 4 Claims

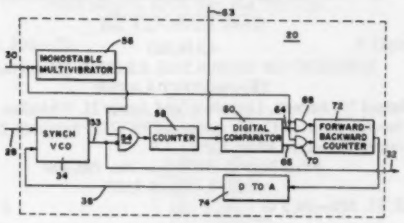
1. A long term stable, programmable clock circuit for use in a pulse-echo ultrasonic apparatus comprising:

a synchronizable voltage controlled oscillator for providing clock pulses;

gated counting means coupled to said oscillator for counting during a predetermined time interval the quantity of said clock pulses and providing a count signal responsive to said quantity;

address means for providing a predetermined count signal;

comparator means coupled to said gated counting means and said address means for comparing said count signal and said predetermined count signal and providing an output signal indicative of a difference between said count signal and said predetermined count signal;



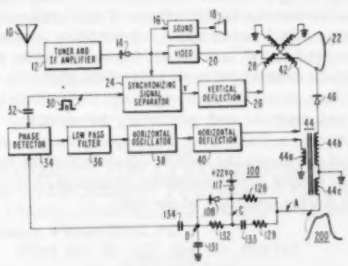
counter means coupled to said comparator means for receiving said output signal and providing a difference count signal, and

means coupled to said counter means and said oscillator for receiving said difference count signal and providing a feedback signal to said oscillator for causing said count signal to be substantially equal to said predetermined count signal.

4,134,082
RAMP GENERATOR FOR HARMONIC TUNED DEFLECTION

Ronald E. Fernsler, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 27, 1977, Ser. No. 864,837
Int. Cl.[2] H03B *3/04;* H04N *5/04*
U.S. Cl. 331—20 9 Claims



1. A television deflection synchronization arrangement comprising:

deflection current generator means for promoting the flow of deflection current at a controllable deflection rate during recurrent scanning intervals and for generating voltage pulses during recurrent retrace intervals;

capacitance means;

charging means comprising first and second serially coupled resistance means coupled to said deflection current generation means and to said capacitance means for providing a path for the flow of current therebetween for generating a recurrent ramp signal across said capacitance means in response to said voltage pulses, said charging means further comprising first unidirectional current conducting means coupled in parallel with said first resistance means;

a source of synchronizing signals;

phase detecting means coupled to said source of synchronizing signals and to said capacitance means for comparing

said recurrent ramp signal with said synchronizing signals and for controlling said deflection rate in response to said synchronizing signals; and

clamping means comprising a reference voltage source and second unidirectional current conducting means coupling said reference voltage source to the junction of said first and second serially coupled resistance means for limiting the voltage at a point on said charging means to a particular value less than the peak voltage of said voltage pulses.

4,134,083

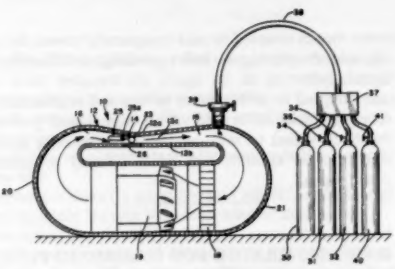
METHOD OF REDUCING ARCING IN A GAS TRANSPORT LASER

Michael W. Sasnett, Los Altos, and Angus H. Whitaker, Monte Sereno, both of Calif., assignors to GTE Sylvania Incorporated, Mountain View, Calif.

Filed May 2, 1977, Ser. No. 793,050

Int. Cl.[2] H01S *3/22*

U.S. Cl. 331—94.5 G **3 Claims**



1. The method of reducing arcing in a continuous wave laser with output power of at least 1 KW, said laser having an enclosure and a lasing medium comprising a mixture of CO_2, He and N_2 recirculated in said enclosure, means for continuously supplying predetermined amounts of said CO_2, He and N_2 from the exterior to the interior of said enclosure, an elongated segmented anode and a coextensive tubular cathode extending parallel to and spaced from said anode, said anode and cathode extending transversely of the direction of flow of said medium, means for applying a high DC voltage across said anode and cathode and producing an electrical discharge therebetween, and means for deriving a beam of coherent light from said discharge, the method consisting of the step of continuously adding a predetermined amount of O_2 to said lasing medium during operation of the laser.

4,134,084

HYBRID LASER STRUCTURES

George Dubé, Temperance, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Sep. 29, 1976, Ser. No. 727,826

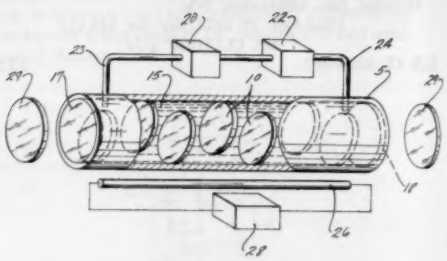
Int. Cl.[2] H01S *3/00*

U.S. Cl. 331—94.5 F **4 Claims**

1. A hybrid laser structure for providing a dual wavelength output and increased efficiency in the use of white pump light, in combination,

(A) a plurality of lasable plate elements having a first absorption region of white pump light and an output beam at a first wavelength, each spaced from its neighbor and in a path along the optical axis of said laser structure, and including means for maintaining said plate elements in said spaced relation; and

(B) a lasable cooling liquid filling the spaces between said plate elements, the liquid having lasing ions having a second absorption region of white pump light and an output beam at a second wavelength, said plate elements and said cooling liquid being chosen so that said first and second output beam wavelengths are not strongly absorbed by either the lasable plate elements or the lasable cooling liquid.



4,134,085

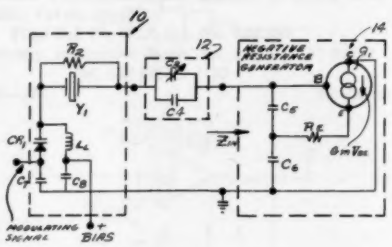
NARROW DEVIATION VOLTAGE CONTROLLED CRYSTAL OSCILLATOR FOR MOBILE RADIO

Michael M. Driscoll, 4823 West Parkway, Baltimore, Md. 21229, and Rafi Arakelian, Khayam Ave., Lashgari St., Noubahar Junction, #62, Shiraz, Iran

Filed May 31, 1977, Ser. No. 801,991

Int. Cl.[2] H03B *5/36*; H03C *3/22, 3/28*

U.S. Cl. 331—116 R **15 Claims**



14. A voltage controlled crystal oscillator (VCXO) comprising:

a resonator including a crystal coupled to a voltage variable capacitance device, and a linearization inductance, said resonator having an effective series resistance; p1 a negative resistance generator, responsive to signals from said resonator, for sustaining oscillation when the magnitude of said negative resistance is greater than the effective series resistance of said resonator;

and means, cooperating with said resonator, for selectively increasing said effective series resistance to a value greater than said negative resistance magnitude at frequencies outside of a predetermined range of frequencies, to prevent thereby oscillation at spurious resonant frequencies of said resonator.

4,134,086

WAVE GUIDE CONNECTION

Paul Thiele, Hanover, and Hans Ulrich Bresch, Langenhagen, both of Germany, assignors to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hanover, Germany

Filed May 2, 1977, Ser. No. 792,725

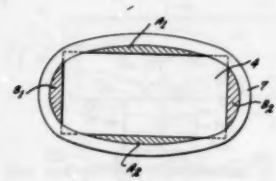
Claims priority, application Fed. Rep. of Germany, May 4, 1976, 2619581

Int. Cl.[2] H01P *5/08, 1/04, 3/12*

U.S. Cl. 333—27 **2 Claims**

1. Wave guide for transmitting electro-magnetic, high-fre-

quency energy from a transmitter to a piece of user equipment having a wave input of rectangular cross section, the wave guide provided for direct connection to the input without interpositioning of a transition member, comprising: a flexible tube of elliptical cross section directly connected to the input thereby defining an abrupt transition zone between rectangle and elliptical cross section establishing diaphragms bounded by



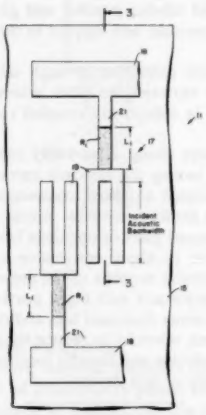
curved portions of the tube and straight line portions of the rectangle input, the cross section of the tube matching the cross section of said input so that the characteristic impedance of the wave guide and of the rectangular input are at least approximately equal; and the diaphragms providing inductive and capacitive impedances in the transition zone as between the wave guide and said input which diaphragm impedances compensate each other.

4,134,087

AMPLITUDE WEIGHTED SURFACE ACOUSTIC WAVE DEVICE

Henry M. Gerard, Capistrano Beach, Calif., and Philip B. Snow, Beaverton, Oreg., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 8, 1977, Ser. No. 785,814
Int. Cl.[2] H03H *9/04, 9/32;* H01L *41/10*
U.S. Cl. 333—72 **2 Claims**



1. An amplitude weighted surface acoustic wave device, comprising:

a substrate of piezoelectric material having a surface capable of supporting propagating surface acoustic wave energy;

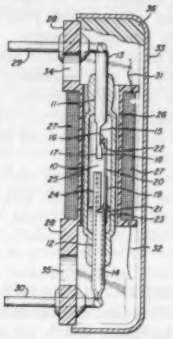
transducer means including at least one resistive weighted transducer array having an interdigital electrode structure disposed on said surface for producing a desired amplitude weighted impulse response, said electrode structure including electrode/resistor tapping elements which are two-metal structures with a relatively lower resistivity layer initially disposed above a relatively higher resistivity layer of a different metal, the upper layer of at least one of said elements being at least partially removed leaving a desired uncovered length of said higher resistivity layer.

4,134,088

MINIATURE MAGNETIC MERCURY-WETTED RELAY CONSTRUCTION

Walter E. Asbell, Westerville; James M. Benjamin, Columbus, both of Ohio; Anthony Tedeschi, Raytown, Mo.; Michael P. VanDerWielen, Andover, Mass., and Larry L. Wiese, Pickerington, Ohio, assignors to Western Electric Company, New York, N.Y. and Bell Telephone Laboratories, Incorporated, Murry Hill, N.J.

Filed May 2, 1977, Ser. No. 793,123
Int. Cl.[2] H01H *29/00*
U.S. Cl. 335—51 **9 Claims**



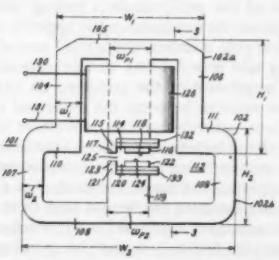
1. A miniature magnetically responsive, mercury-wetted relay construction comprising a magnetic stem member, a magnetic pole-piece member, means for oppositely supporting said stem and pole-piece members, armature means, a magnetic hinge for flexibly mounting said armature means on said stem member to extend over an overlap portion of said pole-piece member, said overlap portion having a recess formed therein to present a surface opposite one face of said armature means, an electrical contact mounted on said pole-piece member on said recess surface spaced apart from said opposite one face of said armature means, and flux concentrator means for concentrating magnetic flux between said pole-piece member and said armature means comprising a projection of said pole-piece member at said overlap portion formed by said recess, said projection extending from said pole-piece member toward said one face of said armature means.

4,134,089

ELECTROMAGNET FOR AN EXTREMELY INVERSE TIME OVERCURRENT PROTECTIVE RELAY

Michael T. Chismar, Gloucester, N.J., assignor to General Electric Company, Philadelphia, Pa.

Filed Jul. 28, 1977, Ser. No. 819,787
Int. Cl.[2] H01F *7/08*
U.S. Cl. 335—225 **5 Claims**



1. An electromagnet for an extremely-inverse time-overcurrent relay comprising:

(a) a magnetic core comprising two E-shaped portions, each portion comprising a base wall and two outer legs and an inner leg projecting laterally from said base wall in spaced-apart relationship, and means joining together the free ends of the outer legs of said two E-shaped portions so that said E-shaped portions face each other in opposed relationship,

(b) each of said inner legs constituting a magnetic pole member, each with an associated pole face at its free end having a slot located therein which divides said pole member into two pole segments with associated pole faces, said pole members being arranged with their pole faces spaced apart, generally aligned, and in opposition to each other to define an air gap between said pole faces adapted to receive a rotatable armature therein;

(c) shading means located in each of said pole face slots and surrounding one of said associated pole segments for providing each said pole member with a shaded pole segment; the shaded pole segment of each pole member having a larger pole face area than the unshaded segment of said pole member, and

(d) energizing means arranged on said core for establishing magnetic flux in said core and through said air gap in response to a sensed circuit current.

4,134,090

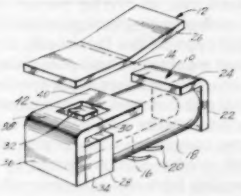
ELECTROMAGNETIC ACTUATOR FOR A RELAY

John C. Schuessler, West Covina; Marvin G. Nelsen, Irvine, and David J. Tapp, Manhattan Beach, all of Calif., assignors to Leach Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 669,217, Mar. 22, 1976, abandoned. This application Oct. 21, 1977, Ser. No. 844,470

Int. Cl.[2] H01F *7/08*

U.S. Cl. 335—229 **19 Claims**



1. A relay comprising a magnetic actuator and an elongated armature pivotally supported between the ends relative to the actuator, whereby the ends of the armature move in opposite directions when the armature is pivoted, the actuator including three pole members, each pole member having a magnetic pole-defining surface adjacent the armature through which lines of magnetic flux pass between the pole and the armature, the three pole defining surfaces being positioned on the same side of the armature, a first one of the pole members having said pole-defining surface adjacent one end of the armature, a second one of the pole members having said pole-defining surface adjacent the armature on the opposite side of the pivot from the first pole member, and a third one of the pole members having said pole-defining surface adjacent the armature extending lengthwise of the armature on either side of the second pole member between the outer end of the armature and the pivot, whereby pivotal movement of the armature away from the pole-defining surface of the first pole member is toward the pole-defining surfaces of the second and third pole members, a permanent magnet connected in a low reluctance magnetic path between the second and third pole members, and an electromagnet connected in a low reluctance magnetic path between the first and second pole members, the armature when pivoted to a first position reducing the reluctance of the flux path between the first and third pole members and when pivoted to a second position reducing the reluctance of the flux path between the second and third pole members.

4,134,091

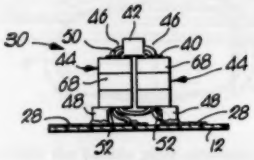
LOW COST, HIGH EFFICIENCY RADIO FREQUENCY TRANSFORMER

Noel A. Rogers, 9121 W. 70th St., Shawnee Mission, Kans. 66204

Continuation-in-part of Ser. No. 749,358, Dec. 10, 1976, abandoned. This application Dec. 8, 1977, Ser. No. 858,808

Int. Cl.[2] H01F *27/08, 27/30, 41/02*

U.S. Cl. 336—61 **14 Claims**



1. An electrical transformer device including:

a first winding comprising a single, unitary, elongate, electrically conductive, tubular member arranged in a generally U-shaped configuration having a bight portion and a pair of legs projecting from said portion,

there being a cut-away zone between said portion and each of said legs to provide a first pair of openings in said member thereat,

the outer extremities of said legs being adapted for connection to one electrical circuit and functioning to physically support said device on a base surface,

said member including a second pair of openings therein respectively in said legs thereof adjacent said extremities of the latter;

magnetic means laterally enveloping central stretches of each said legs; and

a second winding comprising an electrically conductive wire element having the length thereof passed through the interior of said tubular member and generally randomly disposed therewithin with respect to the longitudinal axis of the latter,

said wire element extending through said second pair of openings and between the latter whereby to place said wire element in inductively coupled relationship to said member,

said wire element being electrically insulated from said member and having the opposite extremities thereof respectively adapted to allow connection of said second winding with another electrical circuit.

said first and second pairs of openings being in cooperative communication to allow convection of heat generated within said tubular member to the atmosphere,

said leg extremities and said bight portion functioning to conduct heat away from said legs and radiate the same to the atmosphere, whereby to reduce the operating temperature of said device and thereby increase the power coupling capability of said device.

4,134,092

HEAT ACTIVATABLE ELECTRICAL SWITCH

Raymond G. Lavigne, Waterford, and Gunnar E. Walmet, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 28, 1977, Ser. No. 846,542

Int. Cl.[2] H01H *37/00*

U.S. Cl. 337—298 **9 Claims**

1. An irreversible heat-activatable switch comprising

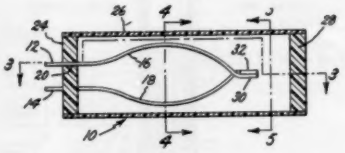
(A) a heat-shrinkable plastic sleeve capable of shrinking in a direction transversely of the longitudinal axis thereof,

(B) first and second elongate resilient electrical conductors,

(C) means disposed near one end of the sleeve for mounting first end portions of said conductors such that the conduc-

tors are disposed in cantilevered manner within the hollow interior of the sleeve,

(D) said conductors having a pair of intermediate generally diverging-converging portions including regions disposed proximate the interior surface of said sleeve, said diverging-converging portions each extending from its respec-



tive first end portion and terminating in a second end portion provided with an electrical contact.

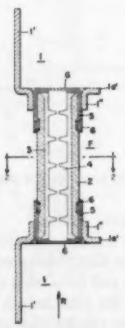
(E) said second end portions being so disposed in generally opposed manner that the open-closed electrical circuit character of the pair of contacts irreversibly changes responsive to movement of said diverging-converging portions resulting from heat-shrinking said sleeve.

4,134,093

ELECTRIC FUSE

Robert J. Panaro, Byfield, Mass., assignor to Gould Inc., Rolling Meadows, Ill.

Filed May 4, 1977, Ser. No. 793,516
Int. Cl.² H01H *85/20*
U.S. Cl. 337—252 **3 Claims**



1. An electric fuse comprising

(a) a pair of spaced terminal members of sheet metal each having a pair of substantially planar arms, said arms enclosing an angle of 90 degrees, one arm of each of said pair of arms having a connecting perforation and the other of said pair of arms having a drawn-out cylindrical projection that extends axially inwardly and is open at both ends;

(b) a fuse including fusible element means, a pulverulent arc-quenching filler surrounding said fusible element means, a casing of insulating material housing said fusible element means and said filler, and ferrule means conductively interconnected by said fusible element means closing both ends of said casing; and

(c) each of said ferrule means being press-fitted into said drawn-out cylindrical projection in said other of said pair of arms and the end surfaces of said ferrule means being flush with the planes defined by said other of said pair of arms.

4,134,094

FUSE ELEMENT

William J. Huber, Racine, Wis., assignor to McGraw-Edison Company, Elgin, Ill.

Filed May 5, 1977, Ser. No. 793,844
Int. Cl.² H01H *85/06, 85/08*
U.S. Cl. 337—292 **5 Claims**

1. A fusible element for a high voltage current limiting fuse which comprises:

two end sections of a first metallic conductive material, each end section including a plurality of serially related fusion points of relatively small cross sectional area where fusion of the fuse element is initiated by high magnitude overcurrents of short duration and intermediate portions of relatively large cross sectional area;

a center section of a second metallic conductive material having a lower melting temperature than said first conductive material of said end section, said center section having opposite ends, and said center section having a melt I^2t at least as great as that of said end sections, and having a lower heat dissipating ability than said fusion points of said end sections, so that fusion is initiated at said center section by overcurrents of lower magnitude and longer duration; and

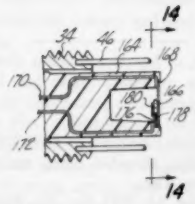
two connecting sections of a third metallic conductive material, the amalgamation time and temperature of said second and third materials being much greater than the amalgamation time and temperature of said first and second materials, each connecting section having a melt I^2t greater that said center section, one of said connecting sections being connected between one end of said center section and one of said end sections, and the other of said connecting sections being connected between the opposite end of said center section and the other of said end sections, to thereby connect said end sections in series through said center section.

4,134,095

FAST RESPONSE TEMPERATURE SENSOR

Junuthula N. Reddy, Troy, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Dec. 5, 1977, Ser. No. 857,559
Int. Cl.² H01C *7/00*
U.S. Cl. 338—25 **4 Claims**



1. A temperature sensor for sensing the temperature of a fluid comprising a base member having at least first and second support arms thereon, fin means formed of a thin disc having a high surface area to mass ratio fixedly mounted said first and second support arms whereby the fluid to be sensed may flow over the top and bottom surface of said fin means, semiconductor means centrally located and mounted on said fin means having the characteristic of changing resistance with changes in temperature, a first output conductor connected to said fin means and embedded in said first support arm, a second output

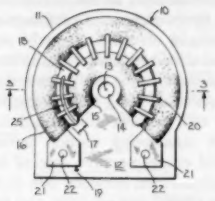
conductor embedded in said second support arm, said first conductor having an end portion thereof in electrical contact with said fin means, insulating means positioned on said fin means between said semiconductor means and an edge of said fin means and separated from said semiconductive means, a third conductor supported on and within the confines of the surface of said insulating means, and bridging conductive means supported in electrical contact with said third conductor and a surface of said semiconductor means and spaced from said fin means for electrically connecting said conductor and said semiconductor means, the end of said second conductor being in electrical contact with said third conductor.

4,134,096

TRIMMABLE RESISTOR

Oscar L. Denes, Milwaukee, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Nov. 10, 1977, Ser. No. 850,288
Int. Cl.² H01C *10/00*
U.S. Cl. 338—195 **13 Claims**



1. A trimmable resistor, which comprises:
a base;
a pair of spaced terminals mounted on the base for connecting the resistor to an electrical circuit;
a pair of resistive strips disposed on the base and spaced apart to define a gap, one of the resistive strips being electrically connected between a pair of terminals;
a plurality of conductive members, each bridging the gap from one resistive strip to the other, at least one of the conductive strips being frangible to trim the resistor; and
an insulating buffer material disposed in the gap below each frangible conductive member.

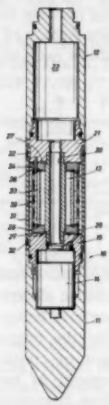
4,134,097

COMBINATION GEOPHONE-HYDROPHONE

Christopher S. Cowles, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 13, 1977, Ser. No. 806,236
Int. Cl.² G01V *1/18, 1/40*
U.S. Cl. 340—7 R **7 Claims**

1. A method for measuring and separating up- and down-traveling seismic waves comprising:
lowering both a geophone and hydrophone to substantially the same depth in a borehole:
packing the borehole with solid material at least to a level above the depth of the geophone and hydrophone;
coupling the hydrophone to a circuit disposed adjacent the hydrophone, said circuit in combination with said hydrophone producing a hydrophone signal in response to pressure having the same phase and amplitude as the signal produced by the geophone in response to velocity;



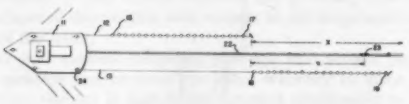
separately coupling said geophone and hydrophone to a recording system; and
separately recording said geophone and hydrophone signals.

4,134,098

MULTIPLE REFLECTION SUPPRESSION IN MARINE SEISMIC EXPLORATION WITH LONG SOURCE AND DETECTOR ARRAYS

William H. Ruehle, Duncanville, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 4, 1977, Ser. No. 765,474
Int. Cl.² G01V *1/38*
U.S. Cl. 340—7 R **2 Claims**



1. An array of seismic sources for marine seismic exploration comprising:
first and second towing cables,
marine seismic sources attached to approximately equally spaced intervals to said towing cables, and
means for extending and retracting one cable with respect to the other so that the total length of the array formed by both towing cables can be changed.

4,134,099

SYSTEM FOR LAND SEISMIC CABLE FAULT LOCATION

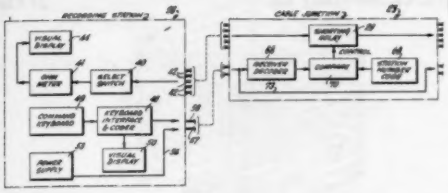
Frank L. Lankford, Jr., Bellaire, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Apr. 15, 1977, Ser. No. 787,717
Int. Cl.² G01V *1/24, 1/22*
U.S. Cl. 340—15.5 TS **1 Claim**

1. In combination with land seismic geophone cables wherein said cables comprise long sections of multi-geophone circuit conductors with electrical connectors at the ends thereof, a plurality of said sections being spread out on both sides of a recording station when in use, the improvement comprising
a relay located at one of said electrical connectors on each of said long cable sections,
said relay having a multi-pole single-throw switch,
first circuit means at said relay location for short circuiting

all of said multi-circuit conductors when said relay is actuated,

command signal means at said recording station comprising a keyboard for selecting a predetermined number to be coded for corresponding to a predetermined one of said relays, and



second circuit means comprising two of said geophone circuit conductors for transmitting said coded signal to said relays and for supplying power to said relay locations,

electronic means for actuating each of said relays upon receipt of said corresponding coded signal, comprising

code means for identifying said predetermined relay, and

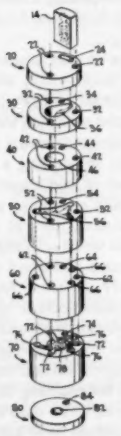
means for comparing said coded signal with said code means.

4,134,100

FLUIDIC MUD PULSE DATA TRANSMISSION APPARATUS

Maurice F. Funke, Columbia, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 30, 1977, Ser. No. 855,863
Int. Cl.[2] G01V *1/40*
U.S. Cl. 340—18 LD **5 Claims**



1. Telemetry apparatus for transmitting data from sensors to the surface during the drilling of a bore hole by generating pressure pulses in a drilling fluid in a drill string, the apparatus comprising:

a vortex valve means, having a vortex chamber which includes radial main inlet ports through which a first portion of said drilling fluid flows, tangential control inlet ports, and an axial outlet, to create a vortex flow in said vortex chamber and thus a high resistance to flow from said inlets to said outlet when fluid is supplied to said control ports and to create substantially radial flow in said vortex chamber and thus a low flow resistance when no fluid is supplied to said control ports; and

a fluidic feedback oscillator having a power jet supplied by a second portion of said drilling fluid, said oscillator including a first output channel connected to said control inlet ports, a second output channel connected to discharge fluid downstream of said vortex valve, and a means to control the frequency of oscillation of said oscillator in response to signals from said sensors;

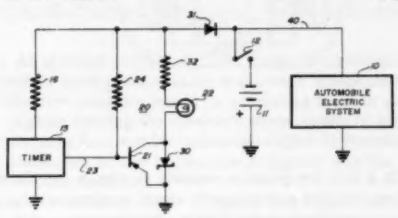
whereby pressure pulses are generated in said drilling fluid in said drill string at a frequency corresponding to the frequency of oscillation of said oscillator and are communicated to the surface.

4,134,101

PROTECTIVE CIRCUIT FOR ELECTRONIC MOTOR VEHICLE ENGINE OPERATING TIMERS

John P. Jones, Jr., Wayne, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 554,248, Feb. 28, 1975, which is a continuation of Ser. No. 388,097, Aug. 14, 1973, abandoned.
This application Aug. 5, 1976, Ser. No. 711,946
Int. Cl.[2] G04F *10/00*; G08B *21/00*
U.S. Cl. 340—52 D **4 Claims**



1. For operation in a motor vehicle electrical system presenting high transient voltages on the order of at least 100 volts when the automobile is operating and when the ignition switch is opened, a combination comprising, an automobile battery, an electrolytic cell connected in said automobile electric system powered by the automobile battery to determine cumulative time of operation of the automobile, an amplifier circuit having therein a single normally nonconductive transistor with a collector-emitter path connected across said battery, a detection circuit incorporating said transistor connected to said timer for turning on said transistor and producing a signal only after a predetermined cumulative time period, a circuit including said ignition switch operable to connect the automobile battery to actuate said electrolytic cell for cumulating time only during operation of the automobile, and a protective circuit for said single transistor comprising

a Zener diode and a crystal diode-resistor combination,

said crystal diode-resistor combination connected in series circuit between said battery and said transistor collector-emitter path,

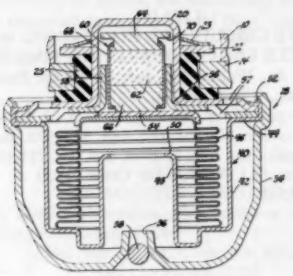
said Zener diode being connected to the collector-emitter terminals of said single transistor, said Zener diode selected for only conducting at a voltage value substantially greater than that of said battery thereby not providing a power supply function for said detection circuit but only the function of limiting the magnitude of high voltage transients occurring across said collector-emitter terminals both during the time the transistor is nonconductive and the transistor is turned on

a lamp coupled in the series circuit with said crystal diode-resistor combination and said Zener diode being directly connected only to said collector-emitter terminals whereby said resistor operates in the dual role as transient suppressor resistor for said Zener diode and along with said lamp as the load resistance for said transistor, said crystal diode limiting the magnitude of high voltage transients occurring in the reverse direction from those limited by said Zener diode thereby to prevent failure of said transistor in the presence of said high voltage transients.

4,134,102
LOW TIRE PRESSURE DETECTOR

John A. Stewart, Flint, and Roy G. Hynes, Flushing, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 14, 1977, Ser. No. 851,489
Int. Cl.[2] B60C 23/04
U.S. Cl. 340—58 1 Claim

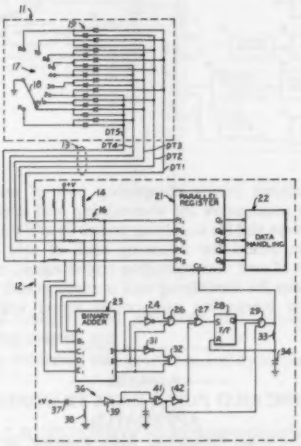


1. In a low tire pressure warning device, a combined low pressure detector and magnetic signal sending unit having a magnet assembly movable within a housing to an outer signal emitting position to generate a minimum strength magnetic flux field outside the housing and to an inner shielded position for which the magnetic flux field outside the housing is substantially below the said minimum strength, an expansible bellows responsive to tire air pressure for moving the magnet assembly to the outer position when tire pressure decreases below a set value and to the inner position when tire pressure increases to a value above the set value, the bellows having a spring force urging bellows expansion and charged inside with a gas at a reference pressure and exposed outside to tire air pressure, one end of the bellows secured relative to the housing and the other end of the bellows being free to move to effect bellows expansion upon decrease of tire pressure relative to the reference pressure, a slug of ferro-magnetic material secured to the free end of the bellows, such that the magnet assembly is attracted to the slug to form a releasable connection between the magnet assembly and the slug, a magnetic flux shunt element carried by the housing and positioned to contact the slug to provide a limit stop for bellows expansion, the flux shunt element including a tubular shield having its axis aligned with the direction of bellows movement, the magnet assembly being partially disposed in the said tubular shield and including a magnet having at least a minimum strength and a polepiece secured adjacent to one pole of the magnet, the polepiece having a radially extending circumferential flange disposed outside the tubular shield to abut the end of the shield to provide a limit stop for the magnet when in shielded position and to provide a flux path from the magnet and through the flux shunt element, the circumferential flange having a preset axial dimension sufficiently thin that it is saturated by the magnetic flux from the magnet when the flange is in contact with the tubular shield to thereby provide a present constant magnetic latching force between the flange and the shield, the bellows when contacting the magnet assembly in the inner shielded position having a spring force greater than the said preset latching force so that in the event of a loss of pressure differential across the bellows the bellows force alone is sufficient to overcome the preset latching force and move the magnet assembly to signal emitting position.

4,134,103
ERROR-REJECTING DATA TRANSMISSION SYSTEM

James T. Huxtable, Peoria; Robert G. Miller, East Peoria, and Tommy E. Robinson, Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 11, 1977, Ser. No. 823,784
Int. Cl.[2] G06F 11/08
U.S. Cl. 340—146.1 AB 27 Claims



1. Apparatus for transmitting words composed of binary bits, comprising:

a sending station,

a receiving station,

transmission means comprising a cable connecting said sending and receiving stations and having N number of transmission lines,

word-selection means at said sending station for selecting one of up to [N!/M!(N−M)!] different words to send, wherein M is an integer and N>M>O,

coding means associated with said transmission lines and said word-selection means and having means at said receiving station for normally impressing a voltage corresponding to a binary 1 on each of said transmission lines and having means for individually grounding a selected (N−M) number of said transmission lines at said sending station in accordance with the word selected by said word-selection means, the distribution of 1's and 0's on said transmission lines being uniquely different for each different word selected by said word-selection means,

counter means for counting the number of binary 1's on said transmission lines at said receiving station,

means at said receiving station and responsive to the count of said counter means for enabling binary data impressed on said transmission lines to be used at said receiving station if the count of 1's is equal to M and for inhibiting such use if said count is not equal to M.

4,134,104
DEVICE FOR DISPLAYING DATA IN THREE DIMENSIONS

Ernest Karras, 10974 Cedar Ave., Bloomington, Calif. 92316

Filed Aug. 25, 1976, Ser. No. 717,496
Int. Cl.[2] G06F 3/14
U.S. Cl. 340—780 10 Claims

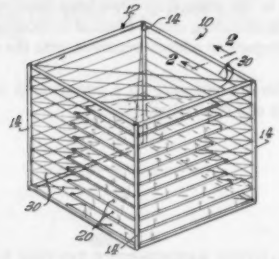
1. A device for providing a data display in a three-dimensional configuration, comprising:

a cubical frame including four vertical posts, a base frame, and a top frame similar to said base frame;

a substantial plurality of transparent planar data sheets in

stacked array, each of the sheets having respective selectively positioned visible datum elements thereon; and

a plurality of support separators mounted in spaced relation on said posts and within said cubical frame to receive and



support respective ones of the transparent planar data sheets in an array stacked one above the other;

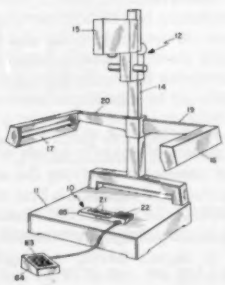
whereby said respective datum elements on the respective data sheets cooperate to define a data display in a three-dimensional configuration.

4,134,105

ALPHANUMERIC DISPLAY DEVICE WITH KEYBOARD FOR USE WITH PHOTOGRAPHIC SYSTEM

Gary D. Stadler, 5459 Moonlight La., La Jolla, Calif. 92037

Filed Feb. 9, 1977, Ser. No. 766,890
Int. Cl.[2] G06F *3/14*
U.S. Cl. 354—105 **19 Claims**



1. A display device for use with a photographic system that includes a platform for receiving objects to be photographed and means for supporting a camera for photographing objects received on said platform, said display device comprising

a plurality of digit sections arrayed to provide a display of a multiple digit number, each of which digit sections includes a display element having an array of a plurality of segments that are separately actuated in response to predetermined combinations of electrical signals for providing a display of a selected numeric character;

selecting means comprising a numeric keyboard device for selecting characters to be displayed; and

circuit means for providing said predetermined combinations of electrical signals in response to the operation of said keyboard, and further including counting means for increasing the displayed number by a predetermined count in response to a predetermined input signal;

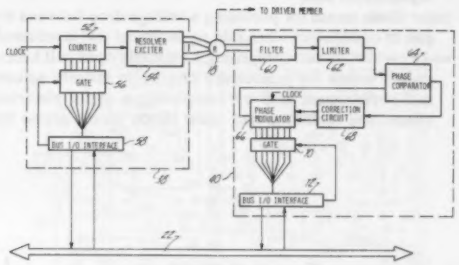
whereby said display device may be positioned on said platform when a photograph is made of an object received on said platform to enable the photograph to include both the image of the selected characters displayed by the display device and the image of said object.

4,134,106

ABSOLUTE RESOLVER ANGLE TO DIGITAL CONVERTER CIRCUIT

William R. Hungerford, Detroit, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Dec. 16, 1976, Ser. No. 751,414
Int. Cl.[2] H03K *13/02*
U.S. Cl. 340—347 SY **22 Claims**



1. An absolute resolver digitizer for use in combination with a resolver having stator means and a rotor means comprising:

reference generator means for generating resolver excitation signals exciting the resolver's stator means to generate a rotating field and for generating digital field position data indicative of the instantaneous angular position of said ratating field; and

resolver follower means for generating digital sum position data indicative of the sum of the instantaneous position of the resolver's rotor means in response to signals induced in the rotor means by said rotating field;

wherein said reference generator means comprises

reference generator counter means for storing counts at a predetermined frequency and for generating an overflow signal when the stored counts reach a predetermined number wherein the number of counts stored in said reference generator counter means is said field position data; and

resolver exciter means for generating said resolver excitation signals in response to said overflow signals; and

wherein said resolver follower means comprises

phrase modulator means for generating phase modulated signals and said digital sum data in response to correction signals;

phase comparator means for comparing the phase of the signals induced in said rotor means with said phase modulated signals to generate error signals indicative of the phase error between the two signals compared; and

correction circuit means for generating said correction signals in response to said error signals.

4,134,107

REPLACEMENT ELEVATOR CALL BUTTON ASSEMBLY

George E. Miller, 161 Spruce St., Massapequa Park, N.Y. 11762, and William J. Casey, 77 Fir St., Valley Stream, N.Y. 11580

Filed Mar. 11, 1977, Ser. No. 776,761
Int. Cl.[2] G06F *19/00*; B66B *3/02*
U.S. Cl. 340—381 **4 Claims**

1. In an elevator operating circuit including a source of D.C. electrical potential at a first voltage, a pair of conductors upon which the electrical potential is normally impressed, and a touch-actuated gas tube connected across the conductor pair for producing a selected drop in the electrical potential therebetween to a predetermined second voltage when the gas tube is actuated so as to summon the elevator to a selected location and for maintaining the selected potential drop throughout an operating cycle of the elevator until the gas tube is subsequently deactivated by impressing a reverse polarity electrical

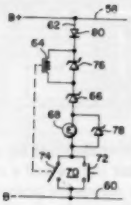
potential upon at least one of the conductor pair at the termination of the operating cycle, a replacement unit for simulating the electrical operation of the gas tube and comprising, in series electrical connection across the pair of conductors:

relay coil means energized upon actuation of said replacement unit and for enabling continued actuation thereof to the termination of the elevator operating cycle,

lamp means for indicating an actuated condition of said replacement unit,

zener diode means for providing a voltage drop between the pair of conductors when said replacement unit is actuated,

and a parallel circuit comprising a normally open call button switch means for momentary closure to initially actuate said replacement unit by completing a series electrical connection including said zener diode means across the



pair of conductors to provide the selected voltage drop therebetween, and normally open holding switch means operably associated with and for closure by said relay coil means for maintaining said completed series electrical connection when said call button means is opened after momentary closure thereof and throughout the remainder of the elevator operating cycle,

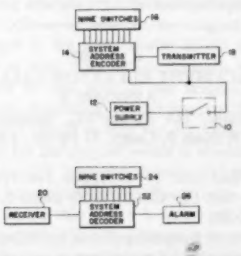
whereby said replacement unit is deactivated at the termination of the elevator operating cycle by impressing a reverse polarity electrical potential upon at least one of the pair of conductors to de-energize said relay coil means, thereby opening said holding switch means to open said completed series electrical connection and enabling the electrical potential to risingly return from the second to the first voltage.

4,134,108

EMERGENCY ALARM DEVICE

Ray W. Palmer, Waukesha, and Fay H. Miller, Milwaukee, both of Wis., assignors to Res'Q, Inc., Milwaukee, Wis.

Filed Jan. 21, 1977, Ser. No. 761,068
Int. Cl.[2] G08B 3/10
U.S. Cl. 340—539 **1 Claim**



1. A transmitter-receiver emergency signalling device, the transmitter of which may be carried on the person, comprising:

(a) means for generating a system address pulse train of a fixed number of pulses, the width of each pulse being determined by whether or not the pulse represents a "one" or a "zero;"

(b) means for setting the pulse width of the pulses in the pulse train and thereby determining the system address;

(c) radio frequency transmission means the carrier signal of which is modulated by the pulse train;

(d) a radio frequency receiver means responsive to the transmitted signal;

(e) means for determing that each of the fixed number of pulses in the pulse train have been received;

(f) address decoding means adapted to receive the pulse train and compare an address received with the system address; and

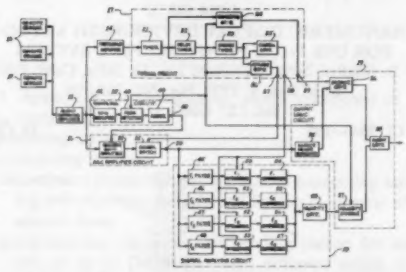
(g) an alarm responsive to a comparison of the received address and the system address.

4,134,109

ALARM SYSTEM RESPONSIVE TO THE BREAKING OF GLASS

Richard E. McCormick, Tempe, Ariz., and Alfred Schneider, Cedar Rapids, Iowa, assignors to Omni Spectra, Inc., Tempe, Ariz.

Filed May 16, 1977, Ser. No. 796,997
Int. Cl.[2] G08B 13/04
U.S. Cl. 340—550 **20 Claims**



1. A circuit for generating an electrical indicating signal in response to a pattern of acoustic signals which comprises:

a. transducer means for receiving the acoustic signals and providing electrical signals at a first output terminal;

b. threshold means coupled to said first output terminal and providing an output signal at a second output terminal in response to signals having a magnitude exceeding a threshold level;

c. switch means coupled to said first output terminal and having a third output terminal and first control terminal, said switch means being actuated by a signal at said first control terminal;

d. signal analyzing means coupled to the third output terminal and having a fourth output terminal and a second control terminal, said signal analyzing means being actuated by a signal at said second control terminal to indicate the presence of at least one frequency component in the signal at said third output terminal;

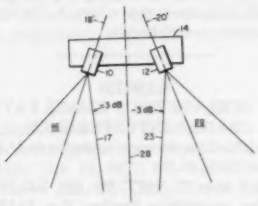
e. output logic means coupled to the third and fourth output terminals and having a third control terminal and a fifth output terminal, said output means providing the electrical indicating signal at said fifth output terminal when actuated by a control signal and signals at the third and fourth output terminals, and

f. timing circuit means coupled to the second output terminal and responsive to the signal from said threshold means for providing first, second and third actuating signals to the first, second and third control terminals respectively, the timing of said actuating signals being determined in accordance with the pattern of acoustic signals to be responded to.

4,134,110
TRANSCEIVER WITH SKEWED TRANSDUCERS FOR LOW CLOSE-IN SENSITIVITY

Aaron A. Galvin, Lexington, Mass., assignor to American District Telegraph Company, New York, N.Y.

Filed Nov. 4, 1976, Ser. No. 738,946
Int. Cl.[2] G08B 13/24; G01S 9/00
U.S. Cl. 340—552 7 Claims



1. For use in an intruder detection system in which a beam is transmitted into an area to be protected, reflections of the beam from objects in the area are received, and signals representative of the received reflections are processed to detect the presence of an intruder, a transceiver comprising:

a transceiver housing;

a transmitting transducer angularly mounted in said housing;

a receiving transducer angularly mounted in said housing;

said transmitting and receiving transducers being spaced apart in said housing by a predetermined distance and symmetrically disposed on respective opposite sides of a transceiver axis;

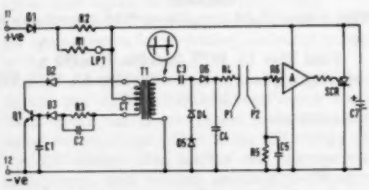
each of said transceivers being angularly disposed in said housing outward of said transceiver axis to provide a radiation pattern symmetrical about the transducer axis angularly outward of said transceiver axis;

the outward angular position of said transducers relative to the transceiver axis being of an angular extent providing substantially reduced close-in effective pattern gain and sensitivity of said transceiver and substantially the same detection-zone sensitivity outside of the close-in range, in comparison to a transceiver having parallel aligned transducers of the same spacing and same pattern.

4,134,111
AEROSOL DETECTOR AND METHOD

Derrick A. Nudds, Plymouth, England, assignor to N.V. Tools Limited, England

Filed Dec. 16, 1976, Ser. No. 751,114
Int. Cl.[2] G08B 17/10
U.S. Cl. 340—629 9 Claims



3. An aerosol detector comprising:

a pair of spaced conductors;

means for applying a DC potential to one of the conductors of sufficient magnitude to ionize the aerosol between the conductors;

means for maintaining the second conductor at ground potential;

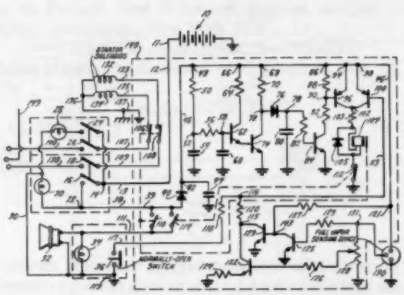
a high gain amplifier having a high input impedance connected to the second of the conductors; and

means for determining when the output of said amplifier exceeds a predetermined level.

4,134,112
VAPOR-SENSING PROTECTIVE SYSTEM

Frank T. Kercheval, 932 Palm, St. Charles, Mo. 63301, and Joseph A. Kretschmer, St. Ann, Mo., assignors to Frank T. Kercheval, St. Charles, Mo.

Filed Jun. 4, 1976, Ser. No. 693,217
Int. Cl.[2] G08B 17/10
U.S. Cl. 340—632 16 Claims

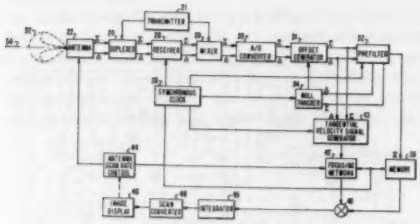


1. A fuel vapor protective system for an engine which comprises a sensing device that can sense for and detect fuel vapor and that experiences a change in the level of conductivity thereof whenever it detects fuel vapor, a control circuit, and an isolating device that can selectively permit or prevent energization of the starter motor of said engine, said control circuit having a first controlling means that is responsive to levels of conductivity of said sensing device within a predetermined range to be in one state thereof and thereby cause said isolating device to permit energization of said starter motor, said first controlling means being responsive to a level of conductivity of said sensing device which is beyond one end of said predetermined range to be in another state thereof and thereby cause said isolating device to prevent energization of said starter motor, and said control circuit having a second controlling means that is responsive to levels of conductivity of said sensing device within said predetermined range to be in one state thereof and thereby cause said isolating device to permit energization of said starter motor, said second controlling means being responsive to a level of conductivity of said sensing device which is beyond the other end of said predetermined range to be in another state thereof and thereby cause said isolating device to prevent energization of said starter motor, said sensing device providing a level of conductivity within said predetermined range which makes certain that said first and said second controlling means are in said one state thereof whenever said sensing device is operative and is properly connected in said system and senses for but does not detect fuel vapor, said sensing device providing said level of conductivity which is beyond said one end of said predetermined range and which makes certain that said first controlling means is in said other state thereof whenever said sensing device is operative and is properly connected in said system and senses for and detects fuel vapor, and said sensing device providing said level of conductivity which is beyond said other end of said predetermined range and which makes certain that said second controlling means is in said other state thereof if said sensing becomes unable to provide a level of conductivity which is within, or which is beyond said one of, said predetermined range because it is not operative although it is properly connected in said system, whereby said first controlling means and said second controlling means coact with said sensing device and with said isolating device to revent energization of said starter motor whenever the level of conductivity of said sensing device is etiher above or below said predetermined range.

4,134,113
MONOPULSE MOTION COMPENSATION FOR A SYNTHETIC APERTURE RADAR

Norman F. Powell, Ilchester, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 18, 1977, Ser. No. 788,208
Int. Cl.² G01S 9/52
U.S. Cl. 343—5 CM **16 Claims**



14. A method for compensating for the radial motion of a synthetic aperture radar which correlates the echo returns of a microwave signal propagated from a stabilized monopulse antenna to form an image of the reflecting surface, said method comprising:

averaging the phase of a predetermined number of the echo returns contained within a given frequency bandwidth to provide prefilter beam segments;

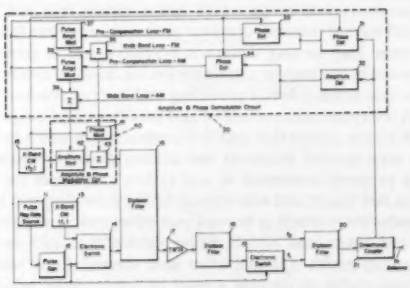
tracking a predetermined amplitude of the echo return signals to determine the angle between the direction of the prefilter beam segments and the direction of the predetermined value of the echo return signals; and

compensating for the phase shift in the echo returns caused by the doppler frequency imposed on the return signals by the radial motion of said synthetic aperture radar in response to the angle between the direction of the prefilter beam segments and the direction of the predetermined value of the echo return signals.

4,134,114
RADAR SYSTEM HAVING AMPLITUDE AND PHASE MODULATION AND DEMODULATION CIRCUITS

Denton D. Riggs, Rancho Palos Verdes, and Gene A. Wagner, Torrance, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 14, 1977, Ser. No. 787,405
Int. Cl.² G01S 7/28, 9/23
U.S. Cl. 343—17.2 R **16 Claims**



7. A system for amplifying a continuous wave signal and a pulsed signal in a common channel while suppressing cross-modulation components comprising:

a source of continuous wave signals;

modulation means coupled to said source of continuous wave signals;

a source of pulsed signals;

combining means coupled to said modulating means and to said source of pulsed signals;

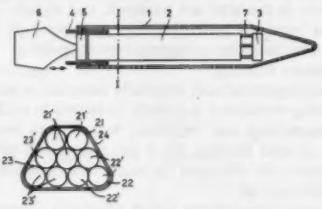
power amplifier means coupled to said combining means; and

demodulating means coupled to said power amplifier means and to said modulating means to receive a portion of the signal energy from said power amplifier means for measuring the phase and amplitude modulation thereon and for providing control signals to said modulating circuit to control said continuous wave signals for suppressing said cross-modulation components.

4,134,115
DEVICE FOR SPREADING OF CHAFF PAYLOADS FOR RADAR INTERFERENCE

Johan P. Ström, Järfälla, Sweden, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 25, 1977, Ser. No. 800,318
Claims priority, application Sweden, Jun. 1, 1976, 7306167
Int. Cl.² G01S 7/38
U.S. Cl. 343—18 B **5 Claims**

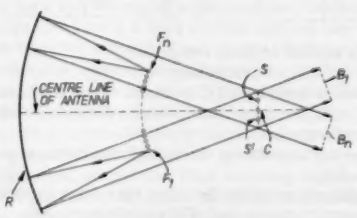


4. A device for spreading radar interferring chaff comprising a cartridge having an output end for dispensing the chaff, a plurality of oblong tubular cells disposed within said cartridge, said cells being arranged in groups each including at least one cell, the cells of each group defining a storage unit for storing chaff of a size different from that stored in at least one other storage unit and means for selectively displacing chaff stored in each of said storage units toward said output end to thereby selectively dispense chaff of a size adapted to interfere at a corresponding radar frequency band, said chaff displacing means including a member arranged in each cell for movement generally parallel to the central axis of the cell for displacing the chaff stored therein and a drive screw coupled to the members arranged in the cells of each storage unit for moving said members toward said output end.

4,134,116
MONITORING COMMUTATED SCANNING RADIO BEAMS

John P. Wild, 3 Strathfield Ave., Strathfield, New South Wales, Australia

Filed May 13, 1977, Ser. No. 796,791
Claims priority, application Australia, May 13, 1976, 5926/76
Int. Cl.² G01S 1/12
U.S. Cl. 343—100 AP **12 Claims**



1. A method of monitoring the beam pointing accuracy of a

commutated scanning beam aerial, characterized in that the scanning beam is generated by sequential connection of aerial feed elements to a radio frequency source, comprising the steps of:

(a) determining the variation with time of the phase difference between a first signal sampled at a point in a region where the field exists at all time due to excitation of the feed elements of the aerial and a second signal; and

(b) observing the occurrence of at least one specific phase difference between the first and second signals which typifies a predetermined position of the scanning beam.

4,134,117

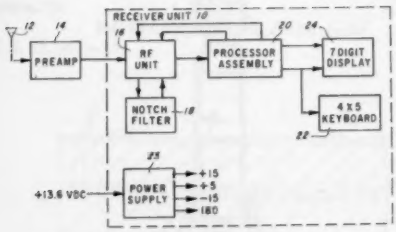
LORAN C RECEIVER

Eugene A. Robinson, and Jerry L. Setliff, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 19, 1977, Ser. No. 843,383

Int. Cl.[2] G01S *1/24*

U.S. Cl. 343—103 **17 Claims**



1. A Loran C receiver comprising:

(a) a keyboard means having a plurality of data entry keys for entering data including a GRI;

(b) a microprocessor connected to the keyboard means for receiving data information including the GRI, the microprocessor including a bit time word producing means;

(c) a timing means connected to the bit time word means of the microprocessor for orienting the microprocessor as to time in response to a time bit word;

(d) a counter connected to the timing means for counting, said counter beginning to count upon receipt of a signal from the timing means indicating orientation of the microprocessor;

(e) a groundwave phase and envelope channel sample strobe generator connected to the counter and microprocessor for producing a plurality of strobe signals at selected time intervals;

(f) a delayed phase channel sample strobe generator means for producing a plurality of timing signals including a cycle done signal for the microprocessor;

(g) a real time clock interrupt connected to the microprocesor timing means for providing a selected count frequency to the microprocessor;

(h) an RF energy receiver means including a phase channel limiter and an envelope channel limiter for processing received RF signals into digital representations of the RF phase and envelope phase of the RF energy cycles;

(i) an RF energy data latches and microprocessor input multiplexer, said latches selectively connected to the phase channel limiter and envelope channel limiter of the RF energy receiver means, and to the groundwave phase and envelope sample strobe generator for sampling the digitized representations of the RF phase and envelope phase of the RF energy cycles at the selected time intervals of the groundwave phase and envelope channel sample strobe generator, and said multiplexer connected to the latches and microprocessor for multiplexing the outputs of the latches of the microprocessor for processing;

(j) a processing means for said microprocessor connected to the multiplexer, said processing means for utilizing the digitized phase information for GRI searching, coarse envelope and cycle identification of the master and secondary signals of the GRI and time difference determinations between the master station and succeeding secondary stations of the GRI; and

(i) display means for displaying the time differences.

4,134,118

AIRCRAFT ANTENNA-SWITCHING ARRANGEMENTS

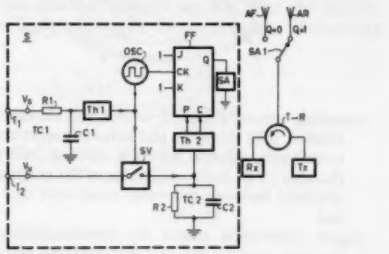
Brian D. Corbett, East Grinstead, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 7, 1977, Ser. No. 757,471

Claims priority, application United Kingdom, Jan. 12, 1976, 992/76

Int. Cl.[2] G01R *29/22*

U.S. Cl. 343—112 S **6 Claims**



1. A control apparatus for a space diversity radio system for a mobile station such as an aircraft, said system having a first antenna for receiving signals from a source of radio signals located in front of the mobile station and a second antenna for receiving signals from a source located to the rear of the mobile station, a receiver and switching means for connecting the receiver to one or the other of the first and second antennas, said control apparatus comprising:

first means for comparing a first signal representative of a signal received through one of the antennas with a first value representative of an acceptable received signal,

means responsive to said first means for activating said switching means when said first signal falls below said first value to thereby connect the receiver to the other antenna,

second means for comparing a second signal indicative of approach or recessional velocity of the mobile station relative to the source of radio signals with a second and third value representative of a predetermined approach velocity and a predetermined recessional velocity, respectively,

said second means being coupled and operative to cause said activating means to activate said switching means and connect said first antenna to said receiver when said second signal is indicative of an approach velocity exceeding said second value and connect said receiver to said second antenna when said second signal is indicative of an recessional velocity exceeding said third value regardless of the value of said first signal.

4,134,119

ANTENNA TEST SHIELD

Oscar A. Sandoz, Ottawa, and Keith E. Hooey, Kanata, both of Canada, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, Ottawa, Canada

Filed Jun. 23, 1977, Ser. No. 809,155

Int. Cl.[2] H01Q *1/28*

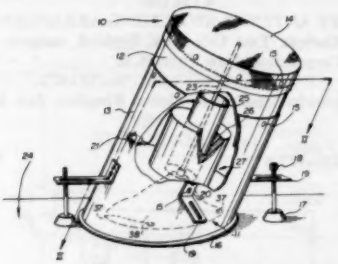
U.S. Cl. 343—703 **12 Claims**

1. A shielded signal coupler for transferring electromagnetic

energy between a signal circuit and an antenna upstanding from a ground-plane surface, the coupler comprising:

Shield means having electrically conductive walls defining a closed chamber, including end portions defining a first opening adapted to admit the antenna;

means for electrically connecting said walls adjacent the first opening with the surface;



coupling means disposed within the chamber in isolated relation with the walls and antenna and in coaxial, energy transferring relation with the antenna, said energy being shielded by an outer conductor of the coupling means and confined between the outer conductor and the antenna; and

signal conduction means for communicating the energy between said circuit and the coupling means through a second opening in said walls.

4,134,120

WHIP ANTENNA FORMED OF ELECTRICALLY CONDUCTIVE GRAPHITE STRANDS EMBEDDED IN A RESIN MATERIAL

Thomas R. DeLoach, and Walter W. Kusek, both of Hampton, S.C., assignors to Coastal Engineered Products Company, Inc., Varnville, S.C.

Filed Oct. 12, 1976, Ser. No. 731,305
Int. Cl.[2] H01Q *1/32*
U.S. Cl. 343—715 **2 Claims**

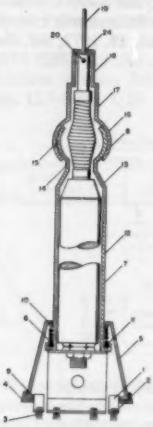
1. An antenna structure comprising a shaft formed of fiber reinforced resin material, the reinforcing fibers being in the form of strands extended longitudinally of the shaft and embedded in the resin material under tension lengthwise of the shaft, reinforcing strands being distributed throughout the section of the shaft and extended in spaced relation to each other throughout the length of the shaft, the reinforcing fibers comprising from about 35% to about 65% of the total weight of the shaft and the reinforcing fibers of the strands being formed of electrically conductive graphite having a modulus of elasticity of at least 28,000,000 psi, and a metal antenna lead-in terminal at one end of the shaft electrically connected with graphite reinforcing strands in the shaft.

4,134,121

SECURITY COVER FOR TRUNK AND ROOF MOUNTED ANTENNA

William Northcutt, 1001 Alcazar, Albuquerque, N. Mex. 87110

Filed Dec. 19, 1977, Ser. No. 861,681
Int. Cl.[2] H01Q *1/42*
U.S. Cl. 343—715 **3 Claims**



1. A security cover for an antenna mounted on an automobile comprising:

a. A means for mounting the cover on the automobile,

b. A mounting pad constructed of resilient material,

c. A base cover which snaps onto the mounting bracket,

d. A main body, which slides through a hole in base cover, having a spring recess, and having a spherical top,

e. A coil spring which slides over the main body and rests on a spring recess in the main body separating the base cover from the main body,

f. A swivel section having a spherical base, which rotatably mates with the spherical top of the main body, and having an intermediate cylindrical section and a top cylindrical section with an antenna hole through which the antenna passes.

4,134,122

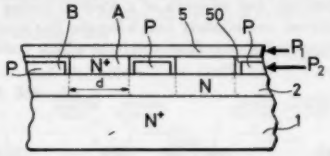
HYPERFREQUENCY DEVICE WITH GUNN EFFECT

Paul C. Moutou, and Jean-Jacques Godart, both of Paris, France, assignors to Thomson-CSF, Paris, France

Continuation of Ser. No. 763,698, Jan. 28, 1977, abandoned, which is a continuation of Ser. No. 635,772, Nov. 26, 1975, abandoned. This application Jan. 26, 1978, Ser. No. 872,554
Claims priority, application France, Nov. 29, 1974, 74 39192
Int. Cl.[2] H01L *47/02*
U.S. Cl. 357—3 **8 Claims**

1. Gunn effect hyperfrequency device comprising an active layer formed of a semiconductor material deposited on a strongly doped substrate of the same type of conductivity, a first anode contact formed by said substrate, and a second cathode contact, wherein said cathode contact comprises a mosaic of conducting zones A adjoining zones B capable of blocking the injection of the current, the respective dimensions of the said zones being such that zones of space charges capa-

ble of reaching said substrate are developed and define a plurality of channels, each having a controlled transverse dimen-



sion d, the product n.d, being lower than $10.^{11}$ cm^{-2}, n being the doping concentration in said active layer.

4,134,123
HIGH VOLTAGE SCHOTTKY BARRIER DIODE

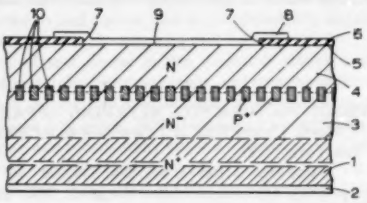
John M. Shannon, Whyteleafe, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 21, 1977, Ser. No. 817,724

Claims priority, application United Kingdom, Aug. 9, 1976, 33044/76

Int. Cl.² H01L *29/48, 29/56, 29/64*

U.S. Cl. 357—15 **9 Claims**



1. A semiconductor device having a high voltage rectifying metal-to-semiconductor junction, which comprises:

a semiconductor body having a substrate of a first type conductivity;

a semiconductor layer of said first type conductivity adjoining said substrate and forming a surface of said body, said semiconductor layer comprising first and second adjacent sublayers of said first type conductivity and having different doping concentrations, a surface of the first sublayer forming the surface of said body and the second sublayer being located between said first sublayer and the substrate;

a low resistance ohmic connection to the semiconductor layer of said first type conductivity;

a metal layer on the surface of the first sublayer which forms the body surface and in electrical contact with a portion of said surface to form a rectifying junction with said first sublayer; and

a plurality of isolated discrete regions of a second type conductivity opposite to that of the first, said regions being distributed along the boundary region between said first and second sublayers of said semiconductor layer and extending at least beneath that portion of the semiconductor body surface contacted by said metal layer.

4,134,124
SEMICONDUCTOR DEVICES AND CIRCUIT ARRANGEMENTS INCLUDING SUCH DEVICES

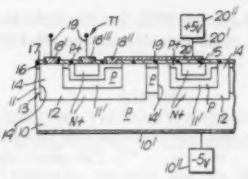
Jeffrey Kane, Cheadle Hulme, England, assignor to Ferranti Limited, Hollinwood, England

Filed Nov. 28, 1977, Ser. No. 855,257

Int. Cl.² H01L *27/04*

U.S. Cl. 357—48 **40 Claims**

1. A circuit arrangement, at least partially embodied in a semiconductor device, in a semiconductor body comprising a thin layer initially wholly of one conductivity type on a substrate of the same conductivity type, the device having a plurality of components, at least one component having a combination of regions comprising a buried layer of the opposite conductivity type at a portion of the interface between the thin layer and the substrate, and an isolation barrier of the opposite conductivity type for the component, the isolation barrier extending through the thin layer to the buried layer, and an inner region of the opposite conductivity type within a region of said one conductivity type defined by the combination of regions, the inner region being adjacent to the surface of the thin layer remote from the substrate and being spaced from the combination of regions, and at least one contact provided on said surface of the semiconductor body, said at least one contact overlying the inner region of the opposite conductivity type, and said at least one component is operably coupled to at least one other component having a combination of regions comprising a buried layer of the opposite conductivity type at a portion of the interface between the thin layer and the substrate, and an isolation barrier of the opposite conductivity



type for said at least one other component, the isolation barrier extending through the thin layer to the buried layer, within the device said at least one component and said at least one other component being spaced from each other within the thin layer, and being substantially electrically isolated from each other within the semiconductor body by regions of the device, of said one conductivity type, and beyond each such component, but contiguous with the outer P-N juncton of the combination of regions of each such component, and the circuit arrangement including means to maintain at least two spaced points of the device at different potential levels, the circuit arrangement being such that a larger, predetermined potential difference is applied between said at least one contact of said at least one component, and the regions of the device beyond, and contiguous with, said at least one component, compared with the potential difference provided between the combination of the buried layer and the isolation barrier of said at least one other component operable coupled to said at least one component, and the regions of the device beyond, and contiguous with, said at least one other component.

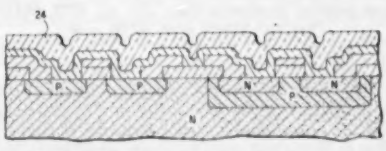
4,134,125
PASSIVATION OF METALLIZED SEMICONDUCTOR SUBSTRATES

Arthur C. Adams, Berkeley Heights; Cesar D. Capio, Fords; Hyman J. Levinstein, Berkeley Heights, and Shyam P. Murarka, Murray Hill, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 20, 1977, Ser. No. 817,175

Int. Cl.² H01L *29/04*

U.S. Cl. 357—54 **2 Claims**



1. A semiconductor device comprising a silicon semiconduc-

tor substrate with a major surface, metal contacts comprising aluminum formed on said substrate, a first layer comprising amorphous silicon with a resistance of at least 10^6 Ω-cm formed over essentially the entire surface of said metal and substrate to a thickness in the range 500-1500 angstroms and metallurgically bonded to said metal contacts, and a second layer comprising silicon nitride formed on essentially the entire surface of said first layer to a thickness in the range 0.5–1.5 μm whereby said amorphous silicon layer inhibits cracking in said silicon nitride layer and cracks which develop in said silicon nitride layer do not propagate through said amorphous silicon layer so that the combination of said layers protects the device including the metal contacts from contaminants and moisture in the air.

4,134,126

COLOR RECORDER HAVING MEANS FOR REDUCING LUMINANCE CROSSTALK IN DISPLAYED IMAGE

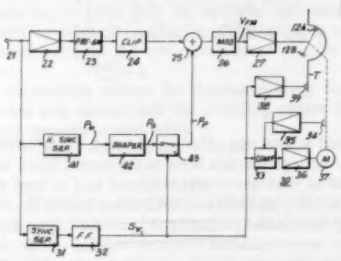
Jun Hirai, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 12, 1977, Ser. No. 815,014

Claims priority, application Japan, Aug. 20, 1976, 51/99963

Int. Cl.² H04N 5/78, 5/79

U.S. Cl. 358—4 **53 Claims**



1. A method of recording a video signal component in successive parallel tracks on a record medium, said video signal component having signal information occurring in successive line intervals, which line intervals occur in successive field intervals, comprising the steps of frequency modulating a carrier with said video signal component to produce a frequency modulated video signal; selectively shifting the phase of said frequency modulated video signal in selected line intervals thereof by inserting a pulse signal of predetermined amplitude and duration into selected line intervals of said video signal component before the frequency modulation of said carrier therewith; and recording the selectively phase shifted frequency modulated video signal in said parallel tracks such that the phase difference between frequency modulated video signals in at least some adjacently recorded line intervals of successive tracks is an odd multiple of π.

4,134,127

COLOR TELEVISION SIGNAL INCLUDING AUXILIARY INFORMATION

Armando Campioni, Turin, Italy, assignor to Indesit Industria Elettrodomestici Italiana S.p.A., Rivalta, Italy

Continuation-in-part of Ser. No. 695,694, Jun. 14, 1976, abandoned. This application Sep. 2, 1976, Ser. No. 719,783

Claims priority, application Italy, Jun. 12, 1975, 68510 A/75

Int. Cl.² H04N 9/46, 9/38, 7/04

U.S. Cl. 358—16 **17 Claims**

1. A method of communicating a color television signal comprising image information including chromatic information as suppressed carrier modulation of a subcarrier, and in addition line synchronizing signals recurring at regular intervals so as to divide said color television signal into a sequence of lines, and field synchronizing signals recurring at regular intervals so as to divide said color television signal into a sequence of fields, every field containing a determined number of lines the majority of which, but not all of which, contain said image information, and wherein, at a position during the line blanking interval, immediately following the line synchronizing pulse of some but not all of the lines which contain said

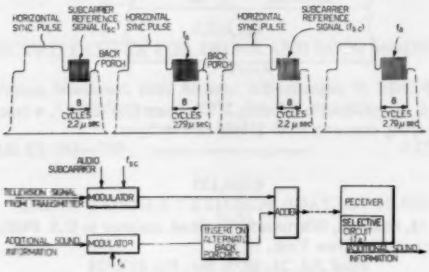


image information, is inserted a subcarrier burst as a reference for subsequent demodulation of the color television signal, and wherein at least one item of supplementary information is inserted at said position during the line blanking interval of only the lines which do not contain said subcarrier burst.

4,134,128

TELEVISION PICTURE SIZE ALTERING APPARATUS

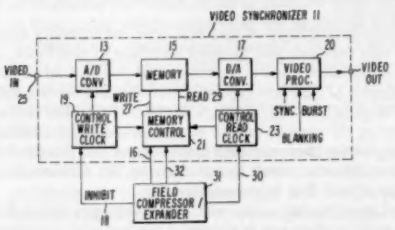
Robert N. Hurst, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,688

Claims priority, application United Kingdom, Mar. 19, 1976, 11111/76

Int. Cl.² H04N 5/22, 5/14

U.S. Cl. 358—22 **11 Claims**



1. Apparatus for altering the size of a television picture without changing the size of the raster, comprising:

means including an analog to digital converter responsive to incoming television video signals for sampling same and providing a predetermined number of digital data signals for each television line representing a predetermined number of samples of the television video signal per line and a predetermined number of lines per field,

means including a digital memory responsive to said data signals for storing same,

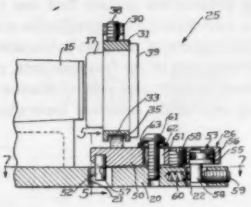
means including a digital to analog converter coupled to said second-mentioned means for reading out and converting said digital data signals whereby said predetermined number of samples per line and lines per field provide a full field of sampled television video signals, and

means coupled to said first-mentioned means and said second-mentioned means for altering the number of data signals per line stored in the digital memory to thereby change the width of the television picture.

4,134,129
TRI-DIRECTIONAL POSITIONING DEVICE FOR OPTICAL SYSTEM INCLUDING LOCKING MEANS

Danny Filipovich, Chicago, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Dec. 13, 1976, Ser. No. 749,846
Int. Cl.[2] H04N 9/04; G03B 33/10, 17/42
U.S. Cl. 358—55 17 Claims



1. An optical system having an optical axis and comprising a plate-like base, a carrier including a plate-like platform and an upstanding frame thereon, said platform lying upon said base, a light detector mounted in said frame, means on said base for directing light to said light detector, first means including a bearing member and a screw having an axis substantially parallel to said optical axis, said bearing member being operatively connected to said carrier, said screw threadably engaging said base and operatively engaging said bearing member, whereby rotation of said screw in one direction moves said carrier toward said light-directing means, and rotation in the opposite direction moves said carrier away from said light-directing means, said first means further including a compression spring having an axis substantially aligned with the axis of said screw and being located between said base and said bearing member and resiliently urging said carrier away from said light-directing means, second means cooperating with said platform and said base for tilting said platform with respect to said base, thereby to tilt said detector with respect to said axis, third means cooperating with said carrier for moving said detector in planes perpendicular to the axis, and means for locking said carrier to preclude operation of said first means, said second means and said third means.

4,134,130
METHOD AND APPARATUS OF INSERTING AN ADDRESS SIGNAL IN A VIDEO SIGNAL

Katsuichi Tachi, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 26, 1977, Ser. No. 819,172
Claims priority, application Japan, Jul. 30, 1976, 51-91878; Jul. 30, 1976, 51-91879; Jul. 31, 1976, 51-91551
Int. Cl.[2] H04N 7/08
U.S. Cl. 358—147 6 Claims

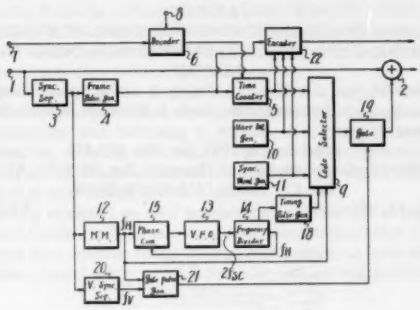
1. A video signal reproducing system comprising:

(a) a tape,

(b) means for reproducing a video signal recorded on said tape, said video signal having a first address signal inserted in the vertical blanking period of said video signal,

(c) means for reproducing a second address signal recorded on a longitudinal track of said tape,

(d) means for selecting one of said first and second address signals, and

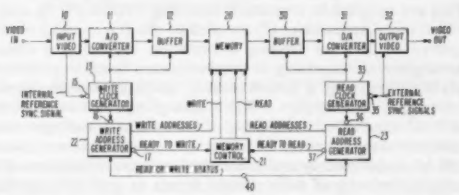


(e) means for controlling said selecting means corresponding to the moving speed of said tape.

4,134,131
DIGITAL VIDEO SYNCHRONIZER

Robert S. Hopkins, Jr., Marlton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 30, 1976, Ser. No. 755,948
Claims priority, application United Kingdom, Mar. 19, 1976, 11112/76
Int. Cl.[2] H04N 5/04, 5/78
U.S. Cl. 358—149 3 Claims



1. A system for processing video information signals in which incoming video signals are written into memory storage means while previously stored video information signals are read out of said memory storage means, comprising:

input means coupled to a source of incoming video information signals;

first reference means coupled to said input means for generating a first reference signal synchronized with said incoming video information;

first processing means coupled to said input means and to said first reference means for processing said video information signals in synchronism with said first reference signal prior to writing into said memory storage means;

second reference means for generating a second reference signal;

second processing means coupled to output means and to said second reference means for processing said stored video information signals read out of said storage means;

memory control means coupled to said memory storage means and responsive to said first and second reference signals for generating periodic read control pulses being synchronous with said second reference signal and for generating non-periodic write control signals being determined by said second reference signals whereby said read control signal reads said stored video information out of said memory storage means at a periodic rate synchronous with said second reference signal while said write control signal writes said incoming video signal information into

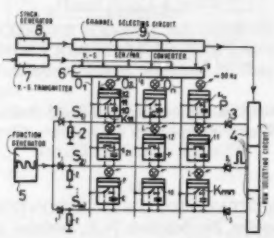
said memory storage means at a non-periodic rate determined by said second reference signal.

4,134,132

CIRCUIT ARRANGEMENT FOR DISPLAY BOARDS HAVING LUMINOUS ELEMENTS ARRANGED IN A MATRIX

Gábor Magos, and József Szalai, both of Budapest, Hungary, assignors to Villamos Berendezés és Készülék Müvek, Budapest, Hungary

Filed Jun. 1, 1977, Ser. No. 802,473
Claims priority, application Hungary, Jun. 29, 1976, VI 1087
Int. Cl.² H04N *3/12*; H05B *39/09*
U.S. Cl. 358—240 **7 Claims**



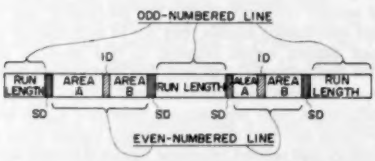
1. A circuit arrangement for the shaded displaying of images on display boards, the latter including single luminous elements (L) arranged in a matrix, said elements having individual switching circuits (P) connecting them to respective ones of a number of row bars ($S_1 \ldots S_m$) and of column bars ($O_1 \ldots O_n$), wherein first ($O_1 \ldots O_n$) and second ($S_1 \ldots S_m$) groups of said bars are coupled to respective selecting circuits (4, 9), and a video-signal transmitter (7) coupled to one ($O_1 \ldots O_n$) of said groups of bars for feeding information thereto; the circuit arrangement comprising, in combination: a function generator (5) for supplying a monotonously varying periodic signal, coupled to another ($S_1 \ldots S_m$) of said groups of bars; wherein at least some of said switching circuits include analog memories (10), comparators (11) having inputs and a constant threshold level, coupled to said memories, and power switches (12) coupled by way of their control inputs to said comparators; said memories including capacitors (C) that are individually connected between said comparator inputs and said another group of bars; and switching elements ($K_{11} \ldots K_{mn}$) individually inserted between said one group of bars and those terminals of said capacitors that are connected to said comparators.

4,134,133

METHOD FOR INTERLINE-CODING FACSIMILE SIGNAL

Hiroichi Teramura, Tokyo; Yasuhiro Yamazaki, Hiratsuka, and Yasushi Wakahara, Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed Jul. 20, 1977, Ser. No. 817,421
Claims priority, application Japan, Jul. 21, 1976, 51-87042
Int. Cl.² H04N *1/40*
U.S. Cl. 358—261 **11 Claims**



1. A method for interline-coding a facsimile signal comprising the steps of:

alternately dividing information of scanning lines of an input facsimile signal into information of at least one first unit line and information of at least one second unit line;

first coding information of a first one of said first unit lines in accordance with a predetermined coding principle;

secondly coding the information of the next one of said first unit lines in accordance with a predetermined coding principle prior to coding of information of said first one of said second unit lines; and

thirdly coding information of said first one of said second unit lines by two-dimensional predictive coding using, as reference information, at least the information of said first one and said next one of the first unit lines, said operations of said second coding and said operation of said third coding being repeatedly achieved thereafter.

4,134,134

APPARATUS FOR PICTURE PROCESSING

Peter Lux, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 8, 1977, Ser. No. 804,719
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1976, 2625973
Int. Cl.² H04N *1/40*
U.S. Cl. 358—280 **12 Claims**

$$\begin{bmatrix}1 & 1\\ 1 & -1\end{bmatrix}\cdot\begin{bmatrix}8 & 3\\ 7 & 1\end{bmatrix}\cdot\begin{bmatrix}1 & 1\\ 1 & -1\end{bmatrix}=\begin{bmatrix}19 & 11\\ 3 & -1\end{bmatrix}$$

$$\begin{bmatrix}1 & 1\\ 1 & -1\end{bmatrix}\cdot\begin{bmatrix}19 & 11\\ 3 & -1\end{bmatrix}\cdot\begin{bmatrix}1 & 1\\ 1 & -1\end{bmatrix}=\begin{bmatrix}32 & 12\\ 28 & 4\end{bmatrix}$$

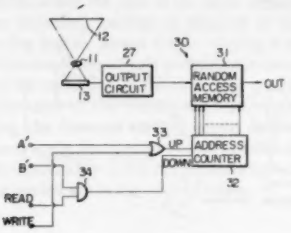
$$\begin{bmatrix}1 & 1\\ 1 & -1\end{bmatrix}\cdot\begin{bmatrix}A1 & A2\\ A3 & A4\end{bmatrix}\cdot\begin{bmatrix}1 & 1\\ 1 & -1\end{bmatrix}=\begin{bmatrix}B1 & B2\\ B3 & B4\end{bmatrix}$$

1. Apparatus for picture processing comprising an input for receiving digitized data values of picture points situated within a predetermined matrix area of $2^N \times 2^N$ points within a picture according to a predetermined sequence among said points, said input being connected to a first input of a storage means having first and second inputs and first and second outputs and a plurality of separately addressable locations, said apparatus further comprising correlating means having its input connected to said first output and its output connected to said second input for receiving the data values stored in subgroups comprising four of said locations and for multiplying the data of each subgroup with data constituting the basic Hadamard matrix of the second order (H2), for generating the sums of said data and three further correlated data values and for producing the resultant data values on its output, said storage means being adapted for storing data values received on its first and second inputs according to a predetermined first address sequence, said storage means being adapted for accessing all stored data values therein received on its first input and all data values of said sums, only once, according to a predetermined second address sequence and producing the accessed data values in subgroups of 2×2 accessed locations on its first output, the data values of each subgroup all having been correlated the same number of times p in said correlating means and representing the digitized data of $2^{p+1} \times 2^{p+1}$ picture points.

4,134,135
OPTOELECTRONIC SCANNING APPARATUS

Toshiyuki Inokuchi, and Yoshiaki Kanmoto, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 11, 1977, Ser. No. 823,695
Claims priority, application Japan, Aug. 18, 1976, 51/98316
Int. Cl.[2] H04N 1/02
U.S. Cl. 358—280 5 Claims

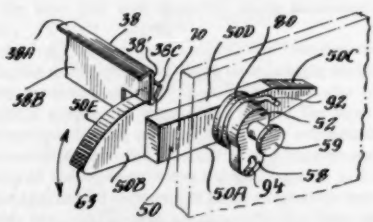


1. An optoelectronic scanning apparatus comprising:
a photosensor array means including a plurality of linearly spaced photosensor elements and means for sequentially enabling the photosensor elements in a first direction;
optical means for scanning an original document in a second direction which is perpendicular to the first direction and focussing a light image of a linear portion of the document on the photosensor array means;
the optical means being further operative to scan the document in a third direction which is opposite to the second direction; and
reversal means operatively connected to the optical means and photosensor array means for controlling the photosensor array means to produce electrical output signals corresponding to scanning the document in a fourth direction which is perpendicular to the second direction when the optical means is scanning the document in the third direction and produce electrical output signals corresponding to scanning the document in a fifth direction which is opposite to the fourth direction when the optical means is scanning the document in the third direction.

4,134,136
PAPER CARRIER FOR FACSIMILE MACHINE

Matthew J. Costello, Bethel; Thomas K. Saunders, New Milford, and Albert M. DeLuca, New Fairfield, all of Conn., assignors to Burroughs Corporation, Detroit, Mich.

Filed Apr. 20, 1977, Ser. No. 789,073
Int. Cl.[2] H04N 1/08; B41F 21/04
U.S. Cl. 358—291 5 Claims

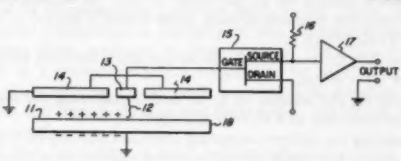


1. In document handling apparatus,
a rotatable cylinder for supporting a sheet of paper,
a band extending across the surface of said cylinder and securing one end of said sheet of paper in place on said cylinder,
spring means pulling said band into engagement with said surface of said cylinder,
a bracket mounted adjacent to said cylinder and adapted to occupy a first position and a second position, such that when said bracket is in said first position, said band engages said bracket as said cylinder is rotated and is pulled away from the surface of said cylinder to permit a sheet of paper to be inserted therebetween or removed therefrom, and when said second means is in said second position, said band does not engage said bracket,
a door extending the length of said cylinder and covering said cylinder, said door being pivotably mounted on said apparatus and including a portion which engages said bracket, whereby said bracket holds said door open when it is in said first position and it holds said door closed when it is in said second position, and
a spring mounted on said bracket and oriented (1) to urge said bracket to hold said door open when said bracket is in said first position or (2) to urge said bracket to hold said door closed when said bracket is in said second position.

4,134,137
SINGLE WIRE MICROELECTROMETER IMAGING SYSTEM

Paul F. Jacobs, Pasadena; Thomas L. Thourson, Clairemont, and Robert C. Speiser, Altadena, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 1, 1976, Ser. No. 737,236
Int. Cl.[2] H04N 1/10
U.S. Cl. 358—293 9 Claims



1. An improved imaging process comprising providing a charge pattern image bearing surface, said image bearing surface comprising a planar shaped photoreceptor, uniformly charging said surface, exposing said surface to penetrating radiation which selectively passes through an object to be analyzed resulting in the formation of a latent electrostatic charge pattern formed in two dimensions, capturing said charge pattern by measuring the magnitude of the charge at points on the image surface by scanning said surface in a two-dimensional, non-rotational manner with a single wire microelectrometer to provide an analog electrical signal in conformity with said charge image pattern, said microelectrometer being moved past said surface, and coupling said electrical signal to a signal processor wherein said electrical signal is processed in a predetermined manner and displayed.

4,134,138
METHOD OF READING ADDRESSES ON A MAGNETIC RECORDING MEDIUM AND APPARATUS FOR PUTTING IT INTO EFFECT

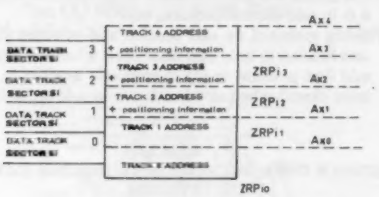
Claude R. Cardot; Jacques P. Droux, both of Paris, and André J. Oisel, Elancourt, all of France, assignors to Compagnie Internationale pour l'Informatique Cii Honeywell Bull, Paris, France

Filed Feb. 2, 1977, Ser. No. 765,057
Claims priority, application France, Sep. 20, 1976, 76 28169
Int. Cl.[2] G11B 5/09
U.S. Cl. 360—39 8 Claims

1. A method of reading addresses on a magnetic recording medium including information items that:
are carried by a plurality of tracks;
are written in a binary code by means of at least one magnetic head, the addresses of the tracks being written within sets of reference zones with each track being associated with at least one zone, each set of zones containing index-

ing indicia to enable the beginning of the set to be found, and each zone including a plurality of individual cells equal in number to the number of bits in the address, each cell containing at least one change of magnetization sense to represent an address bit value, the change of magnetization sense for the address bit value occupying one of only two predetermined positions within the cell, the signals read by the head being shaped into logic pulses, the method comprising:

generating a cyclic reference signal H of precise constant frequency;



deriving a signal SYNCHRO by frequency dividing the signal H and synchronizing signal SYNCHRO with the logic pulses;

combining the SYNCHRO signal and the pulses to derive each address bit so the value of each bit depends on the temporal position of each pulse within a period of signal SYNCHRO;

counting the number of cells so one cell is counted each time a bit is stored;

sampling the address bit by bit and transferring the sampled address bits to a storage member;

enabling the address sampling and the counting of the cells during the entire period required to read each zone.

4,134,139

METHOD AND ARRANGEMENT FOR WRITING AND READING BIT SEQUENCES

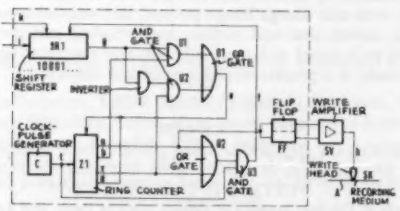
Wolf-Heider Rein, Pforzheim, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jul. 14, 1977, Ser. No. 817,085

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1976, 2633836

Int. Cl.² G11B 5/09

U.S. Cl. 360—44 **4 Claims**



1. A method of writing bit sequences as a self-timing signal wave on a recording medium and for reading said written signal wave comprising the steps of:

coding, prior to a writing operation, given ones of the four possible combinations of two successive bits of a bit sequence and at least one type of single bits;

writing like combinations and like single bits with like spacings between two flux changes on said recording medium;

writing different combinations as well as at least one of said type of single bits with different spacings between two flux changes on said recording medium; and

reading the spacings between flux changes to recover the information written on said recording medium.

4,134,140

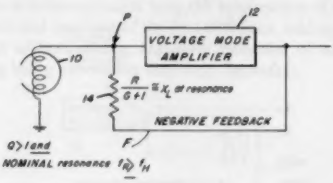
VOLTAGE MODE AMPLIFIER FOR USE WITH A HIGH Q MAGNETIC HEAD

Charles E. Wright, Escondido, and Ward M. Calaway, Sierra Madre, both of Calif., assignors to Eastman Technology, Inc., Rochester, N.Y.

Filed Oct. 1, 1976, Ser. No. 729,506

Int. Cl.² G11B 5/02, 5/45

U.S. Cl. 360—67 **7 Claims**



1. Apparatus for processing a band of frequencies comprising:

(a) a magnetic head comprising a magnetic core and a coil coupled to said core, said head having a Q in excess of 1;

(b) a voltage mode amplifier adapted to receive signals induced in said coil, said amplifier including means for providing said amplifier with predetermined gain; and

(c) negative feedback resistance means connected from the output of said amplifier to the input of said amplifier, said resistance means having a resistance value such that said amplifier means has an input impedance approximately equal to the inductive reactance of said head at resonance; whereby negative feedback serves to reduce the effective resistance of said resistance means and thereby reduce the Q of the head to approximately 1.

4,134,141

RECORDING AND REPRODUCING MEANS

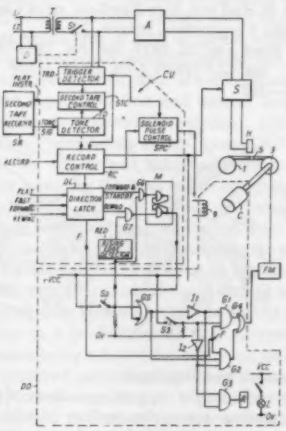
Stephen P. Robinson, Camberley; David C. Evans, Woodley, and Martin Hewitt, Church Crookham, all of England, assignors to Ansafone Limited, Surrey, England

Filed May 16, 1977, Ser. No. 797,112

Claims priority, application United Kingdom, Jul. 26, 1974, 33228/76

Int. Cl.² G11B 15/16, 19/26, 27/22

U.S. Cl. 360—90 **6 Claims**



1. In a recording and reproducing machine which includes recording and reproducing means, means for driving a recording medium forwardly along a predetermined path past the

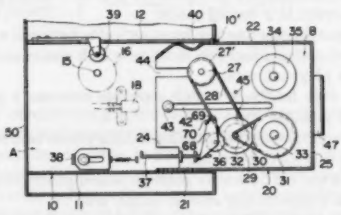
recording and reproducing means, means for switching electrical connections in the machine between a record mode, wherein incoming electrical signals applied to the recording and reproducing means may be recorded on the medium, and a reproducing mode, wherein signals recorded on the medium are reproduced via the recording and reproducing means, the improvement comprising detecting means responsive to the position of said recording medium for assuming a predetermined condition when the end of the most recently recorded signal on the recording medium is adjacent to the recording and reproducing means, means for developing a signal representative of the condition of said switching means, and means responsive to the condition of the detecting means and to the signal representative of the condition of the switching means for controlling the forward driving means so that when the detecting means are in the predetermined condition the driving means can be operated to drive the medium forwardly only if the switching means are in the record mode.

4,134,142

CASSETTE TAPE PLAYER

Tamaki Ohashi, Tokyo, Japan, assignor to Nihon Technical Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 29, 1977, Ser. No. 810,704
Claims priority, application Japan, Jul. 2, 1976, 51-79369
Int. Cl.[2] G11B *15/32*
U.S. Cl. 360—93 **4 Claims**



1. In a tape cassette player having a fixed frame, motor means and a magnetic head mounted on said frame, a movable frame adapted to have a tape cassette removably mounted thereon, means mounting said movable frame on said fixed frame for relative movement therebetween from a first position wherein a tape cassette may be mounted or removed from said movable frame, to a second position wherein a portion of the tape is engaged with said magnetic head, and driving system means connected to said motor means and being adapted to move the tape past said magnetic head, the improvement wherein:

said driving system means comprises: at least one reel shaft adapted to engage a reel of the tape cassette; means rotatably mounting said reel shaft on said movable frame; a capstan adapted to engage one side of the tape; means rotatably mounting said capstan on said movable frame; a rotatable pinch roller adjacent to said capstan and being adapted for movement toward said capstan to hold the tape against said capstan and being adapted for movement away from said capstan to release the tape from said capstan; means for movably mounting said rotatable pinch roller on said movable frame; and

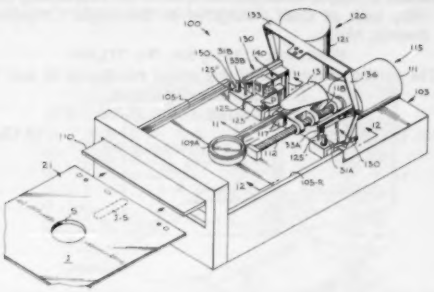
motion-transmitting means connected to said pinch roller mounting means for moving said pinch roller toward said capstan when said movable frame is moved to said second position and for moving said pinch roller away from said capstan when said movable frame is moved to said first position.

4,134,143

APPARATUS FOR DRIVING AND CONTROLLING A PARTITIONABLE FLEXIBLE DISK PACK

Herbert U. Ragle, Thousand Oaks, and Dean L. DeMoss, Camarillo, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Aug. 4, 1976, Ser. No. 711,628
The portion of the term of this patent subsequent to Apr. 25, 1995, has been disclaimed.
Int. Cl.[2] G11B *23/02, 25/04*
U.S. Cl. 360—98 **6 Claims**



1. In an improved data recording and storage apparatus adapted to accommodate portable flexible disk packs, these disk packs comprising a plurality of like circular rotatable recording disks arranged to form a stack, the stack being housed in a spreadable-jacket adapted to be open to admit entry of transducing means while permitting the rotation and partition and transduction of said disks within the jacket; having a pair of opposed panels

each disk including at least one transducing surface and having an encoded arrangement of partition apertures, with predetermined ones of said apertures of different disks disposed in registry to thereby generate a plurality of unique partition-bores extending from one end of the stack to respectively terminate at the surface of respectively different adjacent disks and adapted to accommodate the entry of partition thrust means, "end-wise" of the pack namely transverse to said disk transducing surfaces; and

wherein said apparatus includes drive means for rotating said stack, said drive means being adapted to receive and selectably rotate the stack to a prescribed angular orientation selected to register partition means with a respective unique partition bore through said stack, each angular orientation corresponding with a partition between a different pair of disks;

partition means adapted to direct at least one thrusting force through a panel of said jacket and a selected one of said bores for partitioning said stack between a corresponding pair of adjacent disk surfaces;

transducing means adapted to be selectively translated into the stack between a selected pair of partitioned adjacent disks for performing transducing operations; and

jacket spreading means adapted to automatically part the sides of said jacket means sufficient to permit said pack rotation, transduction and partition operations with the jacket;

the combination therewith of:

jacket receiving means adapted to receive an inserted jacket and be operated in the course of jacket insertion;

first control means adapted to automatically operate said jacket-spreading means responsive to operation of said receiving means and to indication that said jacket means has been registered properly "in place;" as well as to allow closure and removal of said jacket upon withdrawal thereof; and

second control means adapted to automatically operate said partition thrust means responsive to indication that said

jacket and the pack therewithin are properly registered "in place" and that said jacket is properly spread; and to also effect automatic control of said drive means so as to control pack rotation to register said thrust means with a selected one of said partition bores; as well as to also automatically withdraw said thrust means responsive to indication of completion of said transducing opertions.

4,134,144

CARTRIDGE FOR MULTI-DISK PACK

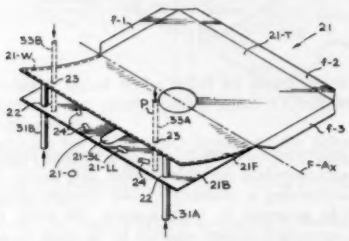
Herbert U. Ragle, Thousand Oaks, and Dean L. DeMoss, Camarillo, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Aug. 4, 1976, Ser. No. 711,579

The portion of the term of this patent subsequent to Apr. 25, 1995, has been disclaimed.

Int. Cl.[2] G11B *23/02, 25/04*

U.S. Cl. 360—133 **13 Claims**



1. A disk pack jacket adapted to contain a rotatable, partitionable pack of flexible recording disks, while partitioned and rotating, this pack comprising:

a plurality of like flexible circular recording disks, the disks being formed and arranged in a concentric stack so that the stack is "partitionable end-wise" namely normal to the disk recording surfaces, rather than from the side;

each said disk of said stack having a central bore for engaging disk pack rotation means and an encoded arrangement of "partition apertures" provided about at least part of a common arcuate segment relatively concentric with the disk center;

the disks being attached together adjacent this central bore and being formed and stacked so that these segments register and so that predetermined, superposed apertures of different disks lie in registry to thereby generate at least one set of "blind deflection bores" extending through the stack from one end thereof, each such bore in a set terminating at a respective different disk in the stack, so as to accommodate the selective partitioning deflection of said respective disk in cooperation with "end-wise partition thrust means" adapted to be selectively thrust along any such bore which has been registered with it to open a partition-gap;

this stack being adapted for access by transducer means, selectively projected into said gap from without to perform recording and read-back operations upon one or more disk surface so exposed by a partition;

this jacket comprising a pair of opposed side panels adapted to be spaced apart sufficient to accommodate said pack during said partitioning and rotation, those panels being joined on at least three sides while leaving an entry-slot therebetween on the fourth side, this entry slot being adapted to accommodate said entry of said transducer means;

at least one panel including partition aperture means disposed and configured to accommodate the passage of said partition thrust means;

each said panel includes a pair of spreader-holes flanking the center of said slot and adapted to accomodate a respective pair of spreader-thrust means, disposed and arranged to be thrust through respective ones of said holes to affect said spreading action and said pivoting of said flap adjacent said slot.

4,134,145

TAPE RECORDER WITH CUE/REVIEW SWITCHING

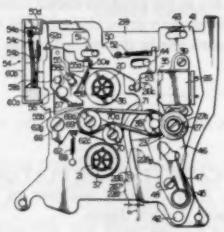
Kazuyasu Motoyama, Hachioji, Japan, assignor to Olympus Optical Company, Ltd., Tokyo, Japan

Filed Aug. 2, 1976, Ser. No. 711,069

Claims priority, application Japan, Aug. 13, 1975, 50/111769[U]; Aug. 14, 1975, 50/112165[U]; Sep. 12, 1975, 50/126671[U]

Int. Cl.[2] G11B *15/04, 15/00*

U.S. Cl. 360—137 **12 Claims**



1. A tape recorder comprising:

(A) a record actuating lever movable between a non-operative position and an operative position which places said recorder in a record mode;

(B) a playback actuating lever movable between a non-operative and an operative position which places said recorder in a playback mode;

(C) a tape feedback switch movable between a non-operative position and:

(1) a first operative position which places said recorder in a fast forward mode;

(2) a second operative position which places said recorder in a non-locked rewind mode; and

(3) a third operative position which places said recorder in a locked rewind mode;

(D) means for moving said tape feedback switch out of its third operative position into its non-operative position responsive to movement of said record actuating lever into its operative position and also responsive to movement of said playback actuating lever into its operative position.

4,134,146

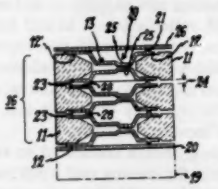
SURGE ARRESTER GAP ASSEMBLY

Earl W. Stetson, Pittsfield, Mass., assignor to General Electric Company, New York, N.Y.

Filed Feb. 9, 1978, Ser. No. 876,480

Int. Cl.[2] H02H *9/06*

U.S. Cl. 361—130 **16 Claims**



1. A spark gap assembly for a surge voltage arrester comprising:

a single electrode having a flat projection surface thereon for defining an extended arcing surface and a pair of flat contact surfaces thereon, one of said contact surfaces, including high-electrical resistive means for limiting current flow to said one surface;

a double electrode structure having a first pair of opposing flat contact surfaces on one side and a second pair of flat opposing contact surfaces on another side thereof, a pair of flat projected surfaces for defining arcing surfaces, said first pair of contact surfaces being electrically coupled together; and

a disc of electrically insulating material separating said single electrode structure and said double electrode structure and providing arc quenching means therebetween said electrodes.

4,134,147

TRANSFER HUMIDITY CONTROL DEVICE

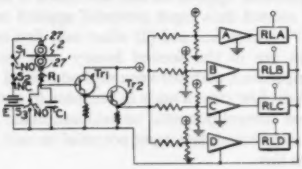
Toshio Watanabe, Ebina, Japan, assignor to Rank Xerox Limited, London, England

Filed Sep. 9, 1977, Ser. No. 832,032

Claims priority, application Japan, Nov. 2, 1976, 51-131209

Int. Cl.[2] H01T *19/00*

U.S. Cl. 361—235 **13 Claims**



1. In an electrostatographic copying system wherein an image on an initial image support is transferred to a second image support by variable transfer means, which transfer is affected by variations in the conductivity of the second image support, wherein said transfer means includes a transfer corona generator means to which a first voltage is applied for applying transfer charges to said second image support, and wherein said transfer means includes an auxiliary transfer corona generator means to which a second voltage is applied for applying pre-transfer charges to said initial image support, the improvement comprising:

conductivity sensing means for sensing the conductivity of the second image support prior to said transfer;

and transfer control circuit means controlled by said conductivity sensing means for varying both said first and second voltages applied to said transfer corona generator means and to said auxiliary transfer corona generator means in response to variations in the conductivity of the second image support sensed by said conductivity sensing means.

4,134,148

ELECTRICAL CONTROL AND SERVICE UNIT

Hans-Joachim Schubert, Moers; Eckart Schunk, Düsseldorf, and Horst Rossbach, Alpen, all of Germany, assignors to Demag, A.G., Duisburg, Germany

Continuation of Ser. No. 653,751, Jan. 30, 1976, and a continuation of Ser. No. 494,059, Aug. 2, 1974, abandoned. This application May 16, 1977, Ser. No. 797,044

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1973, 7329113[U]

Int. Cl.[2] H02B *1/04*

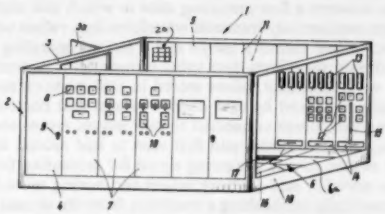
U.S. Cl. 361—334 **2 Claims**

1. A control and service unit for controlling a plurality of separate apparatuses and simultaneously protecting the operators thereof, and having two pairs of opposed spaced-apart walls, a ceiling and a floor forming an enclosed accessible service area, characterized by

(a) one of said walls comprising a plurality of panels, with each said panel containing a plurality of service and control devices for connection to one of said apparatuses;

(b) each of said service and control devices being accessible outside said unit for easy connection to and control of its respective separate apparatus;

(c) a second of said walls comprising a plurality of panels, with each of said panels containing fuse and switch devices for the operation of the service and control devices on one said panel in said one wall;



(d) flow communication means interconnecting the related service and control means on each panel of said one wall with its respective fuse and switch devices on the related panel of said second wall;

(e) said service and control devices of said one wall and the related said switch and fuse devices of said second wall being accessible to said enclosed service area;

(f) said enclosed service area being a walk-in service area for protection of personnel therein; and

(g) said flow communication means being disposed beneath said floor to avoid exposure in said enclosed service area.

4,134,149

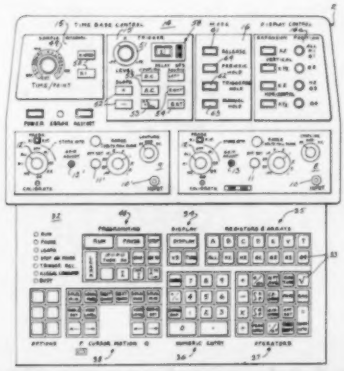
HIGH SWEEP RATE WAVEFORM DISPLAY CONTROL FOR DIGITAL RECORDING WAVEFORM DEVICES

Russell H. Nord, Fort Atkinson, Wis., assignor to Norland Corporation, Fort Atkinson, Wis.

Filed Mar. 26, 1976, Ser. No. 670,889

Int. Cl.[2] G06F *3/14, 3/05*

U.S. Cl. 364—900 **7 Claims**



1. In a waveform display apparatus having a digital memory means including a plurality of memory cells each capable of storing digitized data values, data acquisition and digitization means for sampling an input waveform and generating a sequence of digitized waveform data values and connected to said digital memory means for forming a stored representation of said waveform, trigger means having an input responsive to

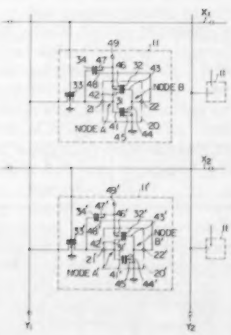
a predefined physical event for establishing a triggering signal and for controlling transmittal of said data values to the memory means, display means connected to said memory means and adapted to present said waveform data values stored in said memory means as a visual representation of said waveform, and control means connected to said digitization means and said display means and said trigger means and operable for selectively establishing and preventing the transmittal of said waveform data values to said memory means for storage and also operable for selectively establishing and preventing the display of said stored waveform data values by said display means, the improvement in said control means for establishing a periodic hold mode of operation wherein the apparatus alternates between a first operating state in which said digitization means continuously transmits waveform data values which are stored in said memory means and a second operating state in which said waveform data value transmittal is prevented and said waveform data values stored in said memory means are visually displayed by said display means, said control means having first means connected to said trigger means and establishing transition from said first state to said second state at a time related to said triggering signal for presenting the waveform stored in said memory means and having second means automatically establishing a transition from the second state to the first state a predetermined time after establishing of the second state for again transmitting data values to said memory means until said time related to said trigger signal, said last named data values replacing data values stored in memory cells of a previously displayed portion of the waveform, and said control means having an input means for activating said first and second means and thereby operating the apparatus to display a rapid succession of individual visual representations of time-spaced portions of said input waveform, each of said portions being related in the same predetermined way in time to the time of each of a succession of said physical events.

4,134,150

RANDOM ACCESS MONOSTABLE MEMORY CELL HAVING BOTH STATIC AND DYNAMIC OPERATING MODES

Kazumasa Shiga, Kawasaki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 17, 1976, Ser. No. 714,999
Claims priority, application Japan, Jul. 20, 1976, 51-86729
Int. Cl.[2] G11C *7/00, 11/40*
U.S. Cl. 365—222 **23 Claims**



1. A method of operating a binary memory cell in a random access memory array including a plurality of X and Y address lines, means for supplying control potentials to said X address lines and means for supplying data input potentials to said Y address lines, said cell including first and second transistors each having a control terminal and first and second controlled terminals which are cross-coupled so that the control terminal of the first transistor is connected to the first controlled terminal of the second transistor defining a first circuit node and the control terminal of the second transistor is connected to the first controlled terminal of the first transistor defining a second circuit node, comprising the steps of:

forward biasing at least one of said first and second transistors in response to a presence of a first control potential applied on an addressed X address line and a first data input potential applied on an addressed Y address line to respectively cause said first and second transistors to assume a first binary state to store a first binary datum statically across said first and second circuit nodes;

reverse biasing at least one of said first and second transistors in response to a presence of said first control potential on said addressed X address line and a second data input potential on said addressed Y address line to respectively cause said first and second transistors to assume a second binary state to store a second binary datum nonstatically across said first and second circuit nodes; and

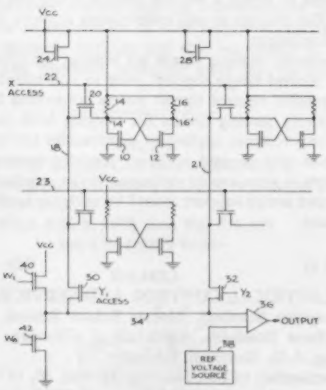
refreshing storage of data in said cell by simultaneously biasing all of said X address lines at the second control potential at periodic intervals and simultaneously therewith biasing all of said Y address lines at said second data input potential while (1) when said first and second transistors are in the first binary state providing a low impedance path between said addressed Y address line and said first circuit node in response to a presence of a second control potential applied on said addressed X address line and said second data input potential applied on said addressed Y address line and (2) when said first and second transistors are in the second binary state providing a higher impedance path between said addressed Y address line and said first circuit node in response to a presence of the second control potential on said addressed X address line and said second data input potential on said addressed Y address line.

4,134,151

SINGLE SENSE LINE MEMORY CELL

Timothy R. O'Connell; Henry R. Edelstein, and George S. Leach, all of Phoenix, Ariz., assignors to Electronic Memories & Magnetics Corporation, Encino, Calif.

Filed May 2, 1977, Ser. No. 792,798
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—189 **4 Claims**



1. A semiconductor static memory system comprising:

a plurality of memory cells arranged in columns and rows, each memory cell comprising a bistable flip-flop device having two FETs, each having its gate electrode connected to the drain electrode of the other FET;

only a single sense line for each column of cells, all the cells in a column being coupleable only to the same only single sense line;

means for applying an operating potential to one end of each sense line;

only a single X access FET means for each cell, each operable for selectively coupling the cell to its corresponding only single line;

detecting means operable when coupled to a cell for detecting data stored in the cell;

a Y access FET means for each column for selectively coupling its corresponding only single sense line to said detecting means; and

means selectively coupled to any one of said sense lines for enabling data storage in a cell coupled to that sense line or the detection by said detecting means of data stored in a cell coupled to that sense line.

DESIGN PATENTS

GRANTED JAN. 9, 1979

ERRATA

For CLASS	See PATENT NO.
D20–008	250,789
D20–009	250,790

DESIGNS

JANUARY 9, 1979

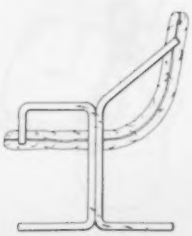
250,736
BRASSIERE
Erica Stern, New York, N.Y., assignor to Genesco, Inc.
Filed Nov. 10, 1976, Ser. No. 740,856
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—24

250,737
APRON
Doris Brosk, 150 E. 69th St., New York, N.Y. 10021
Filed Jun. 28, 1976, Ser. No. 700,309
The portion of the term of this patent subsequent to Aug. 31, 1990, has been disclaimed.
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—226

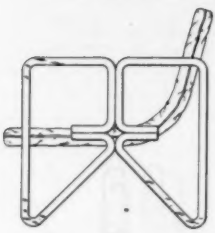
250,738
MASSAGE SANDAL
Peter A. Foldes, Conyngham, Pa., assignor to Oggs Manufacturing Corp., Hazleton, Pa.
Filed Mar. 23, 1977, Ser. No. 780,547
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—293

250,739
DRIVING GLOVE PALM
Cynthia J. Madsen, Neenah, Wis., assignor to Zwicker Knitting Mills, Appleton, Wis.
Filed Dec. 23, 1976, Ser. No. 753,632
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—373

250,740
CHAIR
Steven D. Gageby, 12 Hay Camp Rd., North Oaks, Minn. 55110
Filed Apr. 16, 1976, Ser. No. 677,629
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—67

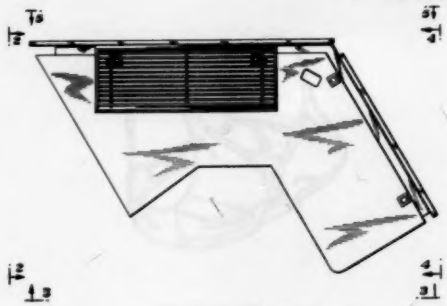


250,741
CHAIR
Steven D. Gageby, 12 Hay Camp Rd., North Oaks, Minn. 55110
Filed Apr. 16, 1976, Ser. No. 677,747
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—67

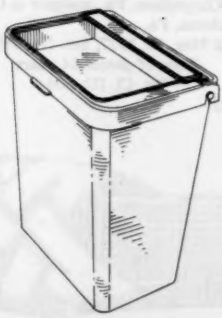


250,742
ROTATABLE HANGER FOR POTTED PLANTS OR THE LIKE
Michael G. Wendler, 1430 E. 1700 South, Salt Lake City, Utah 84105
Continuation-in-part of Ser. No. 563,580, Mar. 31, 1975, abandoned. This application Mar. 22, 1976, Ser. No. 669,158
Term of patent 14 years
Int. Cl. D6—*06;* D8—*08*
U.S. Cl. D6—113

250,743
DISPLAY DESK
Jess Berkman, Wantagh, and Jose R. Bernardo, New York, both of N.Y., assignors to Garban Limited, New York, N.Y.
Filed Dec. 3, 1976, Ser. No. 747,371
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177

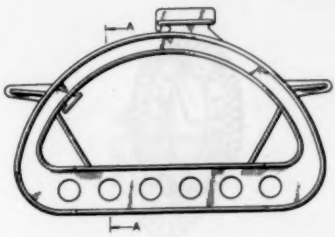


250,744
COMBINED SUPPORT FOR DISPENSER AND WASTE RECEPTACLE
Andre R. Morin, Dollard des Ormeaux, Canada, assignor to GSW Limited - GSW Limitee
Filed Oct. 19, 1976, Ser. No. 733,788
Term of patent 14 years
Int. Cl. D6—*04;* D7—*07*
U.S. Cl. D7—193

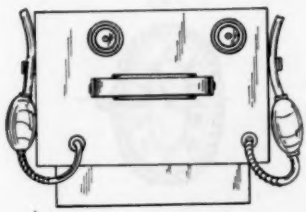


250,745
POWER SCYTHE
Michiyasu Kuwano, Fuchu, Japan, assignor to Kioritz Corporation, Mitaka, Japan
Filed Aug. 11, 1977, Ser. No. 823,866
Claims priority, application Japan, Jun. 1, 1977, 52-21174
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—8

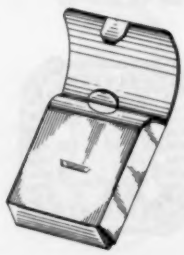
250,746
CONTROL HANDLE FOR KITE
Peter T. Powell, St. Helens, Leckhampton La., Shurdington, Cheltenham, England
Filed Oct. 21, 1976, Ser. No. 734,669
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D8—358



250,747
COMBINED OIL AND GAS CONTAINER AND TOOL BOX
Roxie Mollico, 7760 Rice Lake Rd., Duluth, Minn. 55803
Filed Jan. 10, 1977, Ser. No. 751,351
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—175



250,748
CARTON
Jean Leger, New York, N.Y., assignor to Helena Rubinstein, Inc., New York, N.Y.
Filed Nov. 12, 1976, Ser. No. 741,217
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—235



250,749
WATCH
Alain D. Perrin, Rueil-Malmaison, France, assignor to Cartier International B.V., France
Filed Sep. 14, 1976, Ser. No. 723,057
Claims priority, application France, Mar. 15, 1976, 74.640
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39

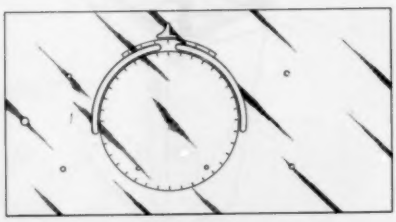
250,750
WATCH
Alain D. Perrin, Rueil-Malmaison, France, assignor to Cartier International B.V., France
Filed Sep. 14, 1976, Ser. No. 723,058
Claims priority, application France, Mar. 15, 1976, 74.640
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39

250,751
WATCH
Alain D. Perrin, Rueil-Malmaison, France, assignor to Cartier International B.V., France
Filed Sep. 14, 1976, Ser. No. 723,059
Claims priority, application France, Mar. 15, 1976, 74.640
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39

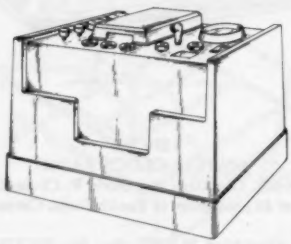
250,752
WATCH
Alain D. Perrin, Rueil-Malmaison, France, assignor to Cartier International B.V., France
Filed Sep. 14, 1976, Ser. No. 723,060
Claims priority, application France, Mar. 15, 1976, 74.640
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39

250,753
THERMOMETER PROBE UNIT
Robert B. Turner, Weymouth; Paul E. Brefka, Southborough; Marvin Menzin, Lexington; Hugh A. Robinson, Wenham, and Thomas S. Williams, Boston, all of Mass., assignors to Johnson & Johnson, New Brunswick, N.J.
Filed Apr. 28, 1976, Ser. No. 681,210
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—60

250,754
NAVIGATION PLOTTER
Charles C. Gray, 2507 S. Robertson Blvd., Los Angeles, Calif. 90034
Filed Jan. 21, 1977, Ser. No. 761,138
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—65



250,755
SPARK PLUG SERVICE UNIT
Lawrence R. Lentz, Sylvania Township, Lucas County; Ronald E. Blackman, and Donald M. Potter, both of Toledo, all of Ohio, assignors to Champion Spark Plug Company, Toledo, Ohio
Filed Oct. 12, 1976, Ser. No. 731,794
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—77

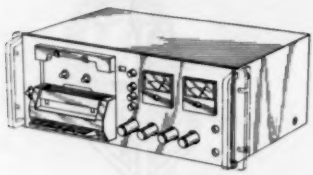


250,756
WEIGHING SCALE
Michael S. Joss, Skokie, and John Zaruba, Chicago, both of Ill., assignors to The Brearley Company, Rockford, Ill.
Filed Jan. 10, 1977, Ser. No. 757,946
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—93

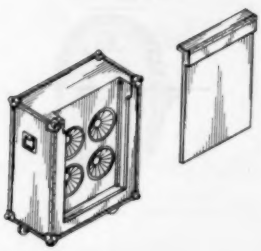
250,757
PENDANT OR SIMILAR ARTICLE
Josef J. Barr, 293 S. County Rd., Palm Beach, Fla. 33480
Filed Sep. 22, 1976, Ser. No. 725,471
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—81

250,758
STATUETTE OR SIMILAR ARTICLE
Alan Braddock, 26 Harold Mount, Hyde Park, Leeds 6, Yorkshire, England
Filed May 6, 1977, Ser. No. 794,569
Term of patent 7 years
Int. Cl. D11—*02*
U.S. Cl. D11—160

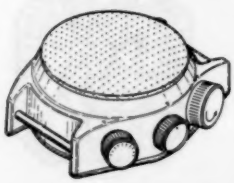
250,759
TAPE DECK
Yoshinobu Asai, Tokyo, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan
Filed Mar. 7, 1977, Ser. No. 775,358
Claims priority, application Japan, Sep. 10, 1976, 51-35922
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—6



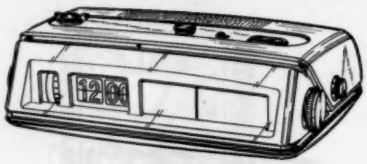
250,760
COMBINED MUSICAL AMPLIFIER AND TRAVELING CASE
Jerome W. Ash, 239 Guinea Woods Rd., Old Westbury, N.Y. 11568, and Paul J. Ash, 380 Front St., Hempstead, N.Y. 11550
Filed Jan. 21, 1977, Ser. No. 760,905
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—34



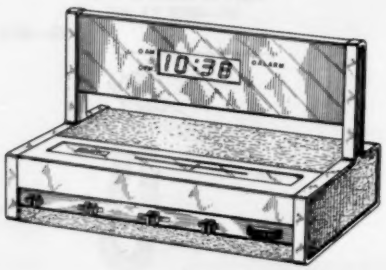
250,761
WRIST RADIO CASE
Hoi T. Vong, Hong Kong, Hong Kong, assignor to Asia International Electronics, Ltd., Hong Kong, Hong Kong
Division of Ser. No. 639,083, Dec. 9, 1975, Pat. No. Des. 246,104.
This application Mar. 16, 1977, Ser. No. 778,315
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—69



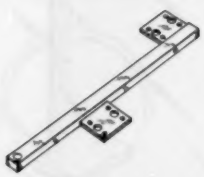
250,762
CLOCK RADIO
Takeyoshi Kawano, Kyoto, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Mar. 17, 1976, Ser. No. 667,803
Claims priority, application Japan, Sep. 19, 1975, 50/38368
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—73



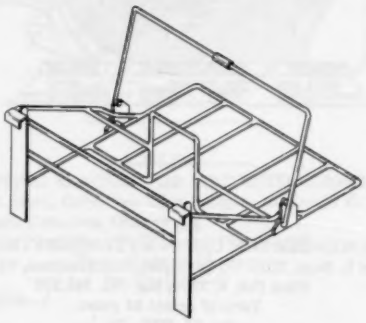
250,763
DIGITAL CLOCK RADIO
Melvin H. Boldt, Glenview, and David P. Chuboff, N. Barrington, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.
Filed May 25, 1977, Ser. No. 800,373
Term of patent 14 years
Int. Cl. D14—*03*; D10—*01*
U.S. Cl. D14—73



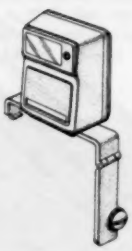
250,764
SUPPORT MEMBER FOR CARRYING A PLURALITY OF GROUND TOOLS
Elmer K. Hansen, 801 S. Martha St., Sioux City, Iowa 51102
Filed Apr. 12, 1977, Ser. No. 786,820
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—28



250,765
FANFOLD SHEET STACKING TRAY
Wayne R. Smith, Henrietta, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Nov. 8, 1976, Ser. No. 739,389
Term of patent 14 years
Int. Cl. D14—*99*; D16—*99*
U.S. Cl. D16—32



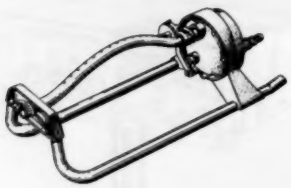
250,766
STROBOFLASH
Shuji Ozawa, Tokyo, Japan, assignor to Sunpak Corporation, Tokyo, Japan
Filed May 23, 1977, Ser. No. 799,750
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—42



250,767
WRITING INSTRUMENT
Giovanni Bulgari, No. 10, Via dei Condotti, Rome, Italy
Filed May 25, 1977, Ser. No. 800,514
Claims priority, application Italy, Dec. 20, 1976, 36133 B/76
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—51

250,768
LAWN SPRINKLER
Edward M. Springer, 8114 S. Kolmar Ave., Chicago, Ill. 60652
Filed Apr. 4, 1977, Ser. No. 784,547
Term of patent 3½ years
Int. Cl. D23—*01*
U.S. Cl. D23—7

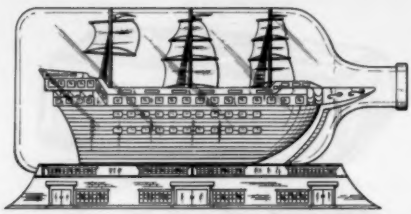
250,769
LAWN SPRINKLER
Roland Dadson, Thame, England, assignor to Hozelock Limited, Aylesbury, England
Filed Sep. 7, 1977, Ser. No. 831,136
Claims priority, application United Kingdom, Mar. 21, 1977, 979322/77
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—8



250,770
NEEDLE
Richard H. McFarlane, 2571 Kaneville Rd., Geneva, Ill. 60134
Filed Mar. 14, 1977, Ser. No. 777,620
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—54

250,771
INVALID'S TREATMENT BASIN STAND
Beatrice M. Charewicz, 28 Longview St., Lanesboro, Mass. 01237
Filed Feb. 10, 1977, Ser. No. 767,305
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—56

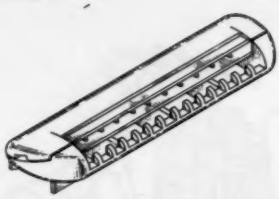
250,772
BUILDING
Anthony J. Leamont, 1609 Timberview La., Arlington, Tex. 76014
Filed Oct. 28, 1976, Ser. No. 736,503
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—11



250,773
APEX MEMBER FOR USE IN A PYRAMID STRUCTURE
Gilbert L. May, 1310 W. Lexington, Independence, Mo. 64050
Filed Feb. 4, 1977, Ser. No. 765,831
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D25—70

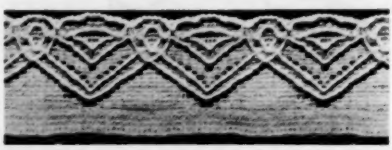
250,774
UNIVERSAL JOINING SECTION FOR LAWN AND GARDEN EDGING
Lawrence R. Martinelli, Chicago, Ill., assignor to United States Gypsum Company, Chicago, Ill.
Filed Mar. 31, 1977, Ser. No. 783,104
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—75

250,775
RAZOR BLADE CARTRIDGE
Evan N. Chen, Fairfield, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Aug. 23, 1976, Ser. No. 716,609
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—47

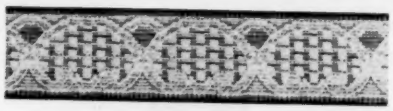


250,776
MOUNTING BRACKET FOR FIRE EXTINGUISHERS
Harold D. Hard, Columbus, Ohio, assignor to Harold D. Hard Company, Columbus, Ohio
Filed Mar. 30, 1977, Ser. No. 783,028
Term of patent 14 years
Int. Cl. D29—*01*
U.S. Cl. D29—5

250,777
ELASTIC LACE TRIM
Alexander M. Smith, II, Elkin, N.C., and Dennis J. Zweig, Marietta, Ga., assignors to Blush Lingerie Corporation
Filed Jan. 4, 1977, Ser. No. 756,716
Term of patent 14 years
Int. Cl. D5—*04*
U.S. Cl. D33—32 R



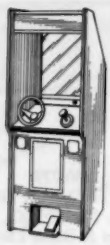
250,778
ELASTIC LACE TRIM
Alexander M. Smith, II, Elkin, N.C., and Dennis J. Zweig, Marietta, Ga., assignors to Blush Lingerie Corporation
Filed Jan. 4, 1977, Ser. No. 756,717
Term of patent 14 years
Int. Cl. D5—*04*
U.S. Cl. D33—32 R



250,779
ELASTIC LACE TRIM
Alexander M. Smith, II, Elkin, N.C., and Dennis J. Zweig, Marietta, Ga., assignors to Blush Lingerie Corporation
Filed Jan. 4, 1977, Ser. No. 756,719
Term of patent 14 years
Int. Cl. D05—*04*
U.S. Cl. D33—32 R

250,780
GAME CABINET
Kenneth W. Sauter, San Jose, Calif., assignor to Atari, Inc., Sunnyvale, Calif.
Filed Feb. 16, 1977, Ser. No. 769,238
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 L

250,781
GAME CABINET
Barney H. Huang, Mountain View, Calif., assignor to Atari, Inc., Sunnyvale, Calif.
Filed Feb. 22, 1977, Ser. No. 770,706
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 L



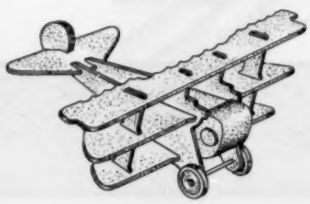
250,782
EXERCISING DEVICE
Stan Gibson, 4060 No. 5 Road, Richmond, B. C., Canada
Filed Apr. 18, 1977, Ser. No. 788,436
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 K

250,783
PLAYGROUND STRUCTURE
Berthold B. Dieter, and Charles L. Gibson, both of Terre Haute, Ind., assignors to Creative Playgrounds Corporation, Terre Haute, Ind.
Filed Aug. 17, 1977, Ser. No. 825,265
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 L

250,784
PLAYGROUND STRUCTURE
Berthold B. Dieter, and Charles L. Gibson, both of Terre Haute, Ind., assignors to Creative Playgrounds Corporation, Terre Haute, Ind.
Filed Aug. 17, 1977, Ser. No. 825,266
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 E

250,785
PLAYGROUND CLIMBER OR THE LIKE
Berthold B. Dieter, and Charles L. Gibson, both of Terre Haute, Ind., assignors to Creative Playgrounds Corporation, Terre Haute, Ind.
Filed Aug. 17, 1977, Ser. No. 825,267
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 H

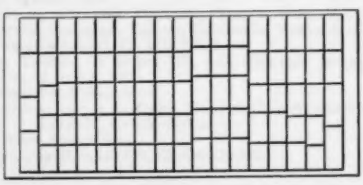
250,786
TOY AIRPLANE
Arthur P. Venditti, Peabody, Mass., assignor to General Mills Fun Groups, Inc., Minneapolis, Minn.
Filed Nov. 12, 1976, Ser. No. 741,183
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 HH



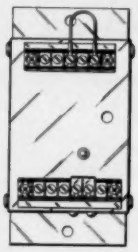
250,787
LINKED FIGURES BATH TOY
Shinroku Nakao, Yokohama; Yoshiyasu Ishii, and Kazuo Nagata, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed May 5, 1977, Ser. No. 794,190
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 B

250,788
BATH TOY
Shinroku Nakao, Yokohama; Yoshiyasu Ishii, and Kazuo Nagata, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed May 18, 1977, Ser. No. 797,962
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 B

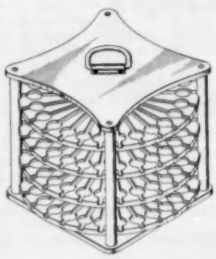
250,789
SIMULATED CIGARETTE PACKAGE DISPLAY PANEL
Edward C. Mergenthaler, Wayne, N.J., assignor to Liggett Group Inc., Durham, N.C.
Filed Jun. 11, 1976, Ser. No. 695,284
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D20—8



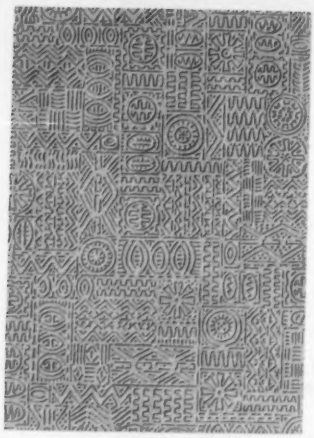
250,790
COMBINED COIN ACCUMULATOR AND TIMER
Lawrence F. Scheiter, Chesterfield, and Raoul DeLorenzi, St. Louis County, both of Mo., assignors to D & S Manufacturing Co., High Ridge, Mo.
Filed Nov. 10, 1976, Ser. No. 740,606
Term of patent 14 years
Int. Cl. D20—*99*
U.S. Cl. D20—9



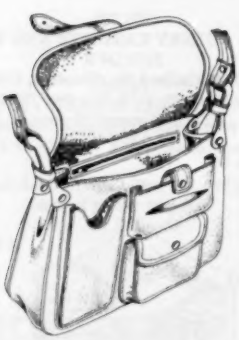
250,791
COMBINED ROTARY CASSETTE AND FILMSTRIP HOLDER
James Mauri, 19372 Gaillard St., Glendora, Calif. 91740
Filed Jul. 19, 1976, Ser. No. 706,881
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 D



250,792
DECORATIVE FACING MATERIAL FOR CEILING PANELS, WALL PANELS, AND THE LIKE
Mark R. Weitzman, Toledo, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed Mar. 18, 1977, Ser. No. 778,918
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D87—3 G

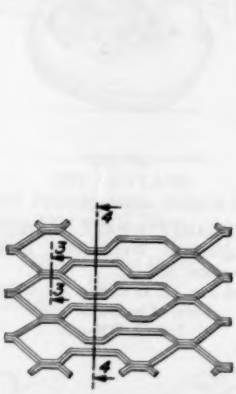


250,793
PURSE
Milton I. Siegel, Scottsdale, Ariz., assignor to Amba Marketing Systems, Inc.
Filed May 31, 1977, Ser. No. 802,290
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 F



250,794
PURSE
Milton I. Siegel, Scottsdale, Ariz., assignor to Amba Marketing Systems, Inc.
Filed Jun. 15, 1977, Ser. No. 806,918
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 F

250,795
EXPANDED METAL SHEET
Orlando A. Jonnum, 12247 Dolan, Downey, Calif. 90242
Filed Jan. 10, 1977, Ser. No. 757,981
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D92—26



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 9TH DAY OF JANUARY, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Chance Company: *See*—
West, Edward L.; and Clutter, Melvin E., 4,133,591, Cl. 339-14.00L.

A. H. Robins Company, Incorporated: *See*—
Cale, Albert D., Jr.; and Jenkins, Herndon, 4,133,881, Cl. 424-244.000.

a Keller & C. Aktiengesellschaft: *See*—
Schulthess, Hans, 4,133,920, Cl. 427-282.000.

Abdulla, Riaz F.; and Terando, Norman H., to Eli Lilly and Company. Preparation of benzoylureas. 4,133,956, Cl. 544-336.000.

Abell, Irwin R., to Temp-Rite, Inc. Insulating window and door construction. 4,133,367, Cl. 160-368.00R.

Abner, Edmund L.: *See*—
Henderson, Claude L.; and Abner, Edmund L., 4,134,070, Cl. 325-15.000.

Adams, Arthur C.; Capio, Cesar D.; Levinstein, Hyman J.; and Murarka, Shyam P., to Bell Telephone Laboratories, Incorporated. Passivation of metallized semiconductor substrates. 4,134,125, Cl. 357-54.000.

Adams, James E.: *See*—
Haas, Werner E. L.; Mechlowitz, Bela; and Adams, James E., 4,133,683, Cl. 96-1.0PS.

Adamus, Hans J.: *See*—
Franzer, Wolfgang; and Adamus, Hans J., 4,133,720, Cl. 202-223.000.

Addis, Carl J., to Wyoming Knife Corporation. Folding locking blade knife. 4,133,106, Cl. 30-160.000.

Adie, Richard A., to Koppers Company, Inc. Filter media support and containment system. 4,133,766, Cl. 210-275.000.

Adler, Karl-Heinz, to Robert Bosch GmbH. Control trigger generating system, particularly to generate a trigger signal used in internal combustion engines, such as an ignition or fuel injection trigger signal. 4,133,323, Cl. 123-117.00R.

Advance Wall Systems, Inc.: *See*—
Slade, Edgar O., deceased, 4,133,097, Cl. 29-564.800.

Aerosol Inventions and Development S.A. AID SA: *See*—
Vercelot, Jean P., 4,133,461, Cl. 222-402.240.

Afromowitz, Martin A.; and Yee, Sinclair S., to University of Washington, The Board of Regents of the. Ion-sensitive electrode and processes for making the same. 4,133,735, Cl. 204-195.00G.

Agency of Industrial Science & Technology: *See*—
Kurane, Ryuichiro; Suzuki, Tomoo; and Takahara, Yoshimasa, 4,133,752, Cl. 210-12.000.

AGFA-Gevaert Aktiengesellschaft: *See*—
Boie, Immo; Kuffner, Karl; Kirchhoff, Gertrud; and Schranz, Karl-Wilhelm, 4,133,958, Cl. 548-321.000.
Renner, Gunter, 4,133,955, Cl. 544-183.000.

Agge, Richard W.; and Kelly, Kenneth W., to Caterpillar Tractor Co. Single lever control apparatus. 4,133,251, Cl. 91-521.000.

Agile Systems, Inc.: *See*—
Griffin, Hugh A., 4,133,404, Cl. 180-79.100.

Agri-Prassco Joint Venture: *See*—
Caldwell, Bob L.; and Fletcher, Ronald B., 4,133,669, Cl. 71-3.000.

Agri-Sul Equipment: *See*—
Caldwell, Bob L.; and Fletcher, Ronald B., 4,133,669, Cl. 71-3.000.

Ahlstone, Arthur G., to Vetco, Inc. Preloaded misalignment pipe connector. 4,133,557, Cl. 285-39.000.

Ahlstone, Arthur G., to Vetco, Inc. Misalignment pipe connector. 4,133,558, Cl. 285-39.000.

Ahmed, Adel A. A., to RCA Corporation. Retrace blanking pulse generator with delayed transition. 4,134,046, Cl. 315-384.000.

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Hayakawa, Akifumi; Aiba, Akira; Orihara, Eiki; and Fukushima, Kiyoshi, 4,133,858, Cl. 264-54.000.

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Jones, John P., Jr., 4,134,101, Cl. 340-52.00D.
Skinner, Ronald W., 4,133,663, Cl. 62-18.000.

Akamatsu, Masahiko, to Mitsubishi Denki Kabushiki Kaisha. Homopolar synchronous machine. 4,134,054, Cl. 318-685.000.

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Nakamura, Hirokazu; Ohinouye, Tsuneo; Hori, Kenji; Kiyota, Yuhiko; Nakagami, Tatsuro; Tsukamoto, Yutaka; and Akishino, Katsuo, 4,133,322, Cl. 123-75.00B.

Akiyama, Taichiro, to Koken Co., Ltd. Plug-type hearing device. 4,133,984, Cl. 179-107.00E.

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Andersson, John N. J.; Karlen, Harry K. G.; and Ulfhielm, Lennart A. U., 4,133,972, Cl. 174-47.000.

Aktieselskabet Rosco: *See*—
Casals, Jose B., 4,133,879, Cl. 424-229.000.

Albert, Kenneth J., to Thermo-Seal, Inc. Drinking vessel cover with valve controlled openings. 4,133,446, Cl. 220-90.400.

Albertson, Clarence E., to Borg-Warner Corporation. Solar powered absorption refrigeration system. 4,133,183, Cl. 62-2.000.

Albrecht, Helmut: *See*—
Bschorr, Oskar; and Albrecht, Helmut, 4,133,157, Cl. 52-403.000.

Albrecht, Peter: *See*—
Joschko, Gunter; and Albrecht, Peter, 4,133,145, Cl. 51-295.000.

Albright, James A., to Velsicol Chemical Corporation. Hydroxyl containing phosphates and polyphosphates. 4,133,846, Cl. 260-928.000.

Albro Fillers and Engineering Company Ltd.: *See*—
Holmes, Gordon; and Martin, Geoffrey R., 4,133,281, Cl. 141-1.000.

Alfred Walter AG: *See*—
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Allen, Bobbie J.: *See*—
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Kuntzsch, Donald W., 4,133,598, Cl. 339-198.00G.

Allen, Howard, to Carando Machine Works. Roll-type machine for forming cylindrical sheet metal bodies. 4,133,197, Cl. 72-15.000.

Allen, Joseph C.; and Porter, John W., to Texaco Inc. Steam flooding hydrocarbon recovery process. 4,133,384, Cl. 166-272.000.

Allen, Royce D.; and Oestmann, Eldon D., to Caterpillar Tractor Co. Vehicle suspension system. 4,133,401, Cl. 180-9.500.

Allenbaugh, Howard M.: *See*—
Sedley, Bruce S.; and Allenbaugh, Howard M., 4,133,194, Cl. 70-222.000.

Allerdist, Heinz, to VDO Adolf Schindling AG. Apparatus for controlling the traveling speed of a motor vehicle. 4,133,406, Cl. 180-105.00E.

Allied Chemical Corporation: *See*—
Li, Hsin L.; Oswald, Hendrikus J.; and Liland, Alfred L., 4,133,087, Cl. 28-257.000.
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Ray, Ranjan, 4,133,679, Cl. 75-123.00B.
Ray, Ranjan, 4,133,681, Cl. 75-170.000.
Ray, Ranjan, 4,133,682, Cl. 75-170.000.

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Ruihley, Robert E.; Perkins, Frank E.; Arps, Robert W.; and Troder, Walter P., 4,133,245, Cl. 85-80.000.

Almasfuzitoi Timfoldgyar: *See*—
Lakatos, Tamas; Miskei, Mihaly; Szolnoki, Janos; Toth, Ferenc; and Revesz, Laszlo, 4,133,866, Cl. 423-208.000.

Alps Electric Co., Ltd.: *See*—
Suzuki, Takeo; Inoue, Ikutaro; Tamai, Hideo; and Aoki, Masatsugu, 4,133,422, Cl. 400-154.500.

Alsthom-Atlantique: *See*—
Berthet, Michel; Gillet, Roger; Marquet, Andre; and Moisson-Franckhauser, Francois, 4,134,037, Cl. 310-52.000.

Aluminiumipari Tervezo es Kutato Intezet: *See*—
Lakatos, Tamas; Miskei, Mihaly; Szolnoki, Janos; Toth, Ferenc; and Revesz, Laszlo, 4,133,866, Cl. 423-208.000.

Aluminum Company of America: *See*—
Peterson, Richard W., 4,133,090, Cl. 29-25.180.
Rogers, Elmer H., Jr., 4,133,727, Cl. 204-67.000.

Ambrose, David W. Pyramid building game. 4,133,538, Cl. 273-276.000.

American Can Company: *See*—
Anderson, Thomas L.; Rasmussen, Glenn A.; and VanHandel, Gerald J., 4,134,004, Cl. 219-387.000.
Kuchenbecker, Morris W., 4,133,429, Cl. 206-465.000.

American Desk Manufacturing Co.: *See*—
Springfield, Billy J., 4,133,579, Cl. 297-452.000.

American District Telegraph Company: *See*—
Galvin, Aaron A., 4,134,110, Cl. 340-552.000.

American Hoechst Corporation: *See*—
Vorrier, Robert J.; and Niaura, Vitas, 4,133,926, Cl. 428-200.000.

American Home Products Corporation: *See*—
Yardley, John P., 4,133,805, Cl. 260-112.50S.

American Hospital Supply Corporation: *See*—
Bloom, William G.; Choksi, Pradip V.; and Spaeth, Edmund E., 4,133,314, Cl. 128-272.300.

American Optical Corporation: *See*—
Rosen, Julius S., 4,133,466, Cl. 224-48.00W.

AMF Incorporated: *See*—
Price, Floyd L., 4,133,527, Cl. 273-63.00D.

AMP Incorporated: *See*—
Cobaugh, Robert F.; Dowling, Edward C.; and Taylor, Attalee S., 4,133,592, Cl. 339-17.00M.
Glover, Douglas W., 4,133,101, Cl. 29-628.000.

Pritulsky, James, 4,133,595, Cl. 339-95.00D.
Anchutin, Andrew, to RCA Corporation. Plural panels deployed effectively as a single panel. 4,133,502, Cl. 244-173.000.
Anders, Leon W.: *See—*
Kohler, Gunter A.; and Anders, Leon W., 4,133,309, Cl. 128-146.600.
Anderson, Gerald B. Engine hoist attachment for automobiles. 4,133,514, Cl. 254-124.000.
Anderson, Mark C., to UOP Inc. Production and recovery of linear mono-olefins. 4,133,842, Cl. 260-683.300.
Anderson, Sandra. Utility bulletin board. 4,133,123, Cl. 40-1.000.
Anderson, Thomas L.; Rasmussen, Glenn A.; and VanHandel, Gerald J., to American Can Company. Electrically heated pizza package. 4,134,004, Cl. 219-387.000.
Andersson, John N. J.; Karlen, Harry K. G.; and Ulfhielm, Lennart A. U., to Aktiebolaget Electrolux. Vacuum cleaner hose having an electrical conductor. 4,133,972, Cl. 174-47.000.
Ando, Shizuo, to Pioneer Electronic Corporation. Audio signal discriminator circuit. 4,134,032, Cl. 307-351.000.
Andre, Elie, to U.S. Philips Corporation. Method for the epitaxial deposition of a semiconductor material by electrical polarization of a liquid phase at constant temperature. 4,133,705, Cl. 148-171.000.
Andren, Lars-Goran H., to Pharmacia Fine Chemicals AB. Separation column. 4,133,562, Cl. 285-187.000.
Andrew, Eugene A., to Olin Corporation. Priming mix with minimum viscosity change. 4,133,707, Cl. 149-28.000.
Angress, Percy G. Foldable portable shelter. 4,133,149, Cl. 52-70.000.
Ansafone Limited: *See—*
Robinson, Stephen P.; Evans, David C.; and Hewitt, Martin, 4,134,141, Cl. 360-90.000.
Anson, Arthur H. Game of skill. 4,133,526, Cl. 273-1.00R.
Antonoplos, Patricia A.; and Heilman, William J., to Gulf Oil Corporation. Resin solutions of acetylene containing polyamide acids. 4,133,792, Cl. 260-30.200.
Aoki, Masatsugu: *See—*
Suzuki, Takeo; Inoue, Ikutaro; Tamai, Hideo; and Aoki, Masatsugu, 4,133,422, Cl. 400-154.500.
Arai, Izumi; Yamada, Yasuteru; Mutsuta, Akio; and Kadota, Kenji, to Sumitomo Heavy Industries, Ltd.; and Sumitomo Metal Industries, Ltd. Method for dehydrating a mixed dust slurry. 4,133,756, Cl. 210-67.000.
Arai, Kenichi, to Minolta Camera Kabushiki Kaisha. Charge-erasing device for electrophotographic copying apparatus. 4,133,609, Cl. 355-3.00R.
Arai, Takao; Okada, Shigeru; Tomatsuri, Kouichi; and Toeda, Hiroshi, to Hitachi, Ltd. Gain control circuit. 4,134,078, Cl. 330-254.000.
Arakelian, Rafi: *See—*
Driscoll, Michael M.; and Arakelian, Rafi, 4,134,085, Cl. 331-116.00R.
Arcamone, Federico: *See—*
Masi, Paolo; Suarato, Antonino; Giardino, Pietro; Bernardi, Luigi; and Arcamone, Federico, 4,133,877, Cl. 424-180.000.
Armour, Bobby D.: *See—*
Robbins, Sammy L.; and Armour, Bobby D., 4,133,572, Cl. 296-23.00R.
Arps, Robert W.: *See—*
Ruihley, Robert E.; Perkins, Frank E.; Arps, Robert W.; and Troder, Walter P., 4,133,245, Cl. 85-80.000.
Arteaga, Eldon F.; and Lydon, James J., Jr. Portable device for use in playing step-ball. 4,133,531, Cl. 273-102.00R.
Arthur, Hugh M.; and Harrington, Timothy C., to Molins Limited. Apparatus for determining the length of a column of tobacco or similar material. 4,133,454, Cl. 222-56.000.
Arthur, Ronald L.; and Rankin, Buddie A., to Speizman Industries, Inc. Stocking toe end closing apparatus. 4,133,277, Cl. 112-121.150.
Asaeda, Tsuyoshi: *See—*
Hosoe, Kazuya; Asaeda, Tsuyoshi; Yokota, Hideo; and Shingu, Tamotsu, 4,133,606, Cl. 354-25.000.
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Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Niwatukino, Tooru, 4,133,471, Cl. 228-107.000.
Asbell, Walter E.; Benjamin, James M.; Tedeschi, Anthony; VanDerWielen, Michael P.; and Wiese, Larry L., to Western Electric Company; and Bell Telephone Laboratories, Incorporated. Miniature magnetic mercury-wetted relay construction. 4,134,088, Cl. 335-51.000.
Ascoli, Enzo, to Gillette Company, The. Dry shavers. 4,133,104, Cl. 30-43.920.
Ashida, Kaneyoshi; Ohtani, Masaaki; Yokoyama, Takashi; and Ohkubo, Shoichi, to Mitsubishi Chemical Industries Ltd. Smoke-retardant polyisocyanurate foam. 4,133,781, Cl. 521-154.000.
Asoyants, Grigory B.: *See—*
Esibyan, Eduard M.; Danchenko, Mikhail E.; Malkin, Vasily B.; Dotsenko, Vsevolod D.; and Asoyants, Grigory B., 4,133,988, Cl. 219-121.00P.
Atal, Bishnu S.; and Schroeder, Manfred R., to Bell Telephone Laboratories, Incorporated. Predictive speech signal coding with reduced noise effects. 4,133,976, Cl. 179-1.00P.
Atari, Inc.: *See—*
Takaichi, Peter L.; and Graybeal, Andrew W., 4,133,530, Cl. 273-85.00G.
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Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., 4,133,180, Cl. 405-170.000.
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Atlantic Richfield Company: *See—*
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Holloway, Richard L.; Edison, Robert R.; and Wachtel, Stephen J., 4,133,644, Cl. 422-138.000.
Wunderlich, Donald K., 4,133,745, Cl. 208-254.00H.
Aubry, Friedhelm: *See—*
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Augstein, Joachim; Carter, David; and Lee, Thomas B., to Fisons, Ltd. 2(5-Tetrazolyl)chromones. 4,133,889, Cl. 424-269.000.
August, Arthur; and Huber, John G., to Grumman Aerospace Corporation. Automated integrated composite lamination system. 4,133,711, Cl. 156-353.000.
Aulich, Hubert; Grabmaier, Josef; and Eisenrith, Karl-Heinz, to Siemens Aktiengesellschaft. Apparatus and method for producing light conducting fibers having a core disposed in a loose fitting cladding tube. 4,133,664, Cl. 65-3.00A.
Austin Powder Company: *See—*
Calder, Brooke J., Jr.; Childs, David L.; Prescott, Roger N.; and Lyons, Donald W., 4,133,247, Cl. 86-20.00C.
Automatic Material Handling, Inc.: *See—*
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Automatic Motor Base Co.: *See—*
Sloyan, Jerome J.; and Kuppek, Anton, 4,133,508, Cl. 248-558.000.
AutoSystems Limited: *See—*
Brook, Richard M., 4,133,098, Cl. 209-565.000.
Azam, Guy; and Perraudin, Claude, to C.G.R.-MeV. Radiation device using a beam of charged particles. 4,134,017, Cl. 250-398.000.
B. F. Goodrich Company, The: *See—*
Layer, Robert W., 4,133,799, Cl. 260-45.80A.
Riew, Changkiu K., 4,133,957, Cl. 544-357.000.
B. V. Nederlandse Kraanbouw Maatschappij NKM: *See—*
Hammink, Willem C.; and Verheul, Cornelis A. M., 4,133,570, Cl. 294-110.00R.
Babaskin, Jury Z.; Efimov, Viktor A.; Sokirko, Leonid A.; Rostovskaya, Leonora A.; Shipitsyn, Sergei Y.; Semenyaka, Georgy D.; and Lutsenko, Georgy G. Method of producing dopant material for iron or nickel-base alloys. 4,133,680, Cl. 75-129.000.
Bach, Jean-Francois; and Hamburger, Jean, to Institut National de la Sante et de la Recherche Medicale (Inserm). Polypeptide possessing thymic activity. 4,133,804, Cl. 260-112.00R.
Bachhuber, Philip C.: *See—*
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Bachhuber, Theodore J.; and Bachhuber, Philip C., to Mayville Engineering Company, Inc. Ammunition casing resizer. 4,133,249, Cl. 86-23.000.
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Jensen, Bruce W.; and Bacon, David L., 4,133,359, Cl. 144-193.00R.
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Bafford, Richard A.; and Mageli, Orville L., to Pennwalt Corporation. Process for bi-organic peroxides. 4,133,835, Cl. 568-558.000.
Baginski, John R.; and Goodpastor, William H., to Procter & Gamble Company, The. Dauber and method of assembly. 4,133,614, Cl. 401-206.000.
Baichtal, James R.: *See—*
Helliwell, Bradley A.; and Baichtal, James R., 4,133,979, Cl. 179-15.0BY.
Bailey, Donald L., to EMDE Corporation. Syringe-like apparatus with removable capillary cartridge. 4,133,304, Cl. 128-2.00F.
Bakalyar, Stephen R.; and Honganen, Ronald E., to Spectra-Physics, Inc. Chromatographic apparatus and method. 4,133,767, Cl. 210-31.00C.
Baker, Lamar T., to Xerox Corporation. Two-page interweaved random access memory configuration. 4,133,611, Cl. 365-51.000.
Baker Perkins Holdings Limited: *See—*
Wilson, Peter G., 4,133,163, Cl. 53-52.000.
Baker, William H. Automated pool level and skimming gutter flow control system. 4,133,058, Cl. 4-172.170.
Baker, William H. Automated surge weir and rim skimming gutter flow control system. 4,133,059, Cl. 4-172.170.
Balcke-Durr Aktiengesellschaft: *See—*
Huda, Josef; Coenenberg, Heinrich; and Aubry, Friedhelm, 4,133,198, Cl. 72-321.000.
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Baldus, Heinz-Dieter: *See—*
Heinemann, Otto; Schmits, Heinz-Herbert; and Baldus, Heinz-Dieter, 4,133,488, Cl. 241-79.000.
Balfanz, Robert W., to S. C. Johnson & Son, Inc. Overcap for aerosol container. 4,133,448, Cl. 220-306.000.
Ballard, Thomas B. Cleaning machine for simultaneously cleaning the interior and exterior of hollow articles. 4,133,340, Cl. 134-112.000.
Balles, Richard; and Balles, William F., Sr. Electrically operated player controlled apparatus for providing a game of skill. 4,133,525, Cl. 273-1.00E.

Balles, William F., Sr.: *See—*
Balles, Richard; and Balles, William F., Sr., 4,133,525, Cl. 273-1.00E.
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Dardai, Pal; Meckl, Ferenc; Papp, Jozsef; and Varga, Elemer, 4,134,034, Cl. 310-11.000.
Baratin, Andre N.: *See—*
Picandet, Jean A.; and Baratin, Andre N., 4,133,986, Cl. 179-170.0NC.
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Malafouris, Dannie O., 4,133,335, Cl. 126-9.00R.
Barber-Colman Company: *See—*
Schewe, Richard A., 4,133,493, Cl. 242-154.000.
Bardin, Robert; and Leymarie, Hubert, to Rhone-Poulenc Industries. Retaining device for apparatus having semi-permeable membranes. 4,133,764, Cl. 210-236.000.
Barker, Charles R., III, to Bose Corporation. Loudspeaker system with broad image source with directionality control for the tweeter. 4,133,975, Cl. 179-1.00E.
Barker, Jeter O.: *See—*
Bell, Oliver A., Jr.; Gilleland, Randall C.; and Barker, Jeter O., 4,134,000, Cl. 219-69.00C.
Barker, Sidney A.; Somers, Peter J.; and Woodbury, Robin R., to Imperial Chemical Industries Limited. Separation of sugars from mixtures. 4,133,696, Cl. 127-46.00A.
Barlew, Israel. Exercise apparatus. 4,133,524, Cl. 272-111.000.
Bartholomew, Roger F.; Haynes, William L.; and Sanford, Leon M., to Corning Glass Works. Hydration of silicate glasses in alcohol-water solutions. 4,133,665, Cl. 65-30.00E.
BASF Aktiengesellschaft: *See—*
Gnad, Gerhard, 4,133,806, Cl. 260-156.000.
Koester, Eberhard; Deigner, Paul; Falk, Roland; Uhl, Karl; Schaefer, Dieter; Mayer, Dieter; Motz, Herbert; and Felleisen, Peter, 4,133,911, Cl. 427-130.000.
Nissen, Axel; and Kaibel, Gerd, 4,133,836, Cl. 568-596.000.
Scheuermann, Horst; and Hoch, Helmut, 4,133,828, Cl. 260-508.000.
Siegel, Hardo; and Naarmann, Herbert, 4,133,946, Cl. 526-282.000.
BASF Wyandotte Corporation: *See—*
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Batz, Hans-Georg; Linke, Hans-Ralf; Stellner, Klaus; and Weimann, Gunter, to Boehringer Mannheim GmbH. Dicarboxylic acid esters of cardiac glycosides. 4,133,949, Cl. 536-7.000.
Bauer, Dan O.; and Pauwels, Michael A., to Pneumo Corporation. Transducer for directly converting mechanical displacement to phase information. 4,134,065, Cl. 324-208.000.
Baumstingl, Herbert, to Papeteries de Belgique. Process and means for preforming containers or cartons from a tube which is formed of a material which can be automatically welded by pressure. 4,133,162, Cl. 53-450.000.
Bausch & Lomb, Inc.: *See—*
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Baxter Travenol Laboratories, Inc.: *See—*
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Bayer Aktiengesellschaft: *See—*
Beck, Manfred; Marwede, Gunter; and Fritz, Rainer, 4,133,845, Cl. 260-880.00B.
Blahak, Johannes; Wagner, Kuno; Mazanek, Jan; and Haas, Peter, 4,133,943, Cl. 521-163.000.
Germerdonk, Rolf; and Jonas, Adam, 4,133,650, Cl. 55-49.000.
Bayerische Motoren Werke Aktiengesellschaft: *See—*
Matthiessen, Otto, 4,133,112, Cl. 33-169.00R.
Bayraktaroglu, Burhan: *See—*
Hartnagel, Hans L.; Hannah, Stephen J.; and Bayraktaroglu, Burhan, 4,133,724, Cl. 204-38.00A.
Beale, John H.; and Moss, Ernest K., to Celotex Corporation, The. Closed cell phenolic foam. 4,133,931, Cl. 428-315.000.
Beard, Robert M.: *See—*
Walker, Raymond W.; and Beard, Robert M., 4,133,992, Cl. 200-81.00R.
Beattie, Robert W. Device for recording changes in indicia. 4,133,289, Cl. 116-309.000.
Beck, Manfred; Marwede, Gunter; and Fritz, Rainer, to Bayer Aktiengesellschaft. Polysegment copolymers. 4,133,845, Cl. 260-880.00B.
Beck, William P., to Sunbeam Corporation. Comb assembly for an electric dry shaver. 4,133,103, Cl. 30-43.000.
Beckman, Eugene B., to Foster Wheeler Energy Corporation. System for removing pollutants from gases having internal bypass capability. 4,133,659, Cl. 55-314.000.
Becorit (G.B.) Limited: *See—*
Hill, John M.; and Garnish, Brian R., 4,133,654, Cl. 55-222.000.
Becton, Dickinson and Company: *See—*
Kippel, Edward A.; and Huston, Paul O., 4,133,656, Cl. 55-274.000.
Bedenbender, John W.: *See—*
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Beecham Group Limited: *See—*
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Beery, Jack, to Burroughs Corporation. Improved inking apparatus. 4,133,262, Cl. 101-350.000.
Beeson, Thomas T.; and LaMonica, Salvatore A. Table lighter device. 4,133,450, Cl. 220-411.000.
Begley, Paul M.: *See—*
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Beletsky, Vyacheslav A.: *See—*
Tabelev, Vladislav D.; Puzrin, Leonid G.; Kaschenko, Vladimir M.; Beletsky, Vyacheslav A.; and Blanin, Valentin A., 4,133,473, Cl. 228-215.000.
Belfils, Larry M. Can crusher. 4,133,261, Cl. 100-280.000.
Bell & Howell Company: *See—*
Filipovich, Danny, 4,134,129, Cl. 358-55.000.
Bell, Oliver A., Jr.; Gilleland, Randall C.; and Barker, Jeter O., to Colt Industries Operating Corp. Protection circuit for electrical discharge machining power supply apparatus. 4,134,000, Cl. 219-69.00C.
Bell Telephone Laboratories, Incorporated: *See—*
Adams, Arthur C.; Capio, Cesar D.; Levinstein, Hyman J.; and Murarka, Shyam P., 4,134,125, Cl. 357-54.000.
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Atal, Bishnu S.; and Schroeder, Manfred R., 4,133,976, Cl. 179-1.00P.
Kibler, Lynden U., 4,133,981, Cl. 179-15.0BS.
Belles, Wayne S.: *See—*
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Shen, Kelvin K.; and Belles, Wayne S., 4,133,673, Cl. 71-88.000.
Bellocci, Rio; and Degois, Michel, to Pont-a-Mousson S.A. Method and apparatus for low-pressure casting in a sand mould. 4,133,370, Cl. 164-309.000.
Beloit Corporation: *See—*
Hergert, Richard E., 4,133,715, Cl. 162-341.000.
Bemis Company, Inc.: *See—*
Odom, Robert E.; and Lieder, Gaylerd M., 4,133,254, Cl. 93-53.0SD.
Bendig, Larry L.: *See—*
Ziegenhain, William C.; Poe, Ronald L.; Bendig, Larry L.; and Scamehorn, John F., 4,133,871, Cl. 423-628.000.
Bendix Corporation, The: *See—*
Hungerford, William R., 4,134,106, Cl. 340-347.0SY.
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Bennett, Leslie B. Anti-skid device for vehicles. 4,133,481, Cl. 238-14.000.
Bennett, Ronald W.; and Williams, Herbert H. Articulating gangway. 4,133,067, Cl. 14-71.300.
Benson, Carl F.; and Humphrey, Harold W., Jr., to Torrington Company, The. Valve control mechanism. 4,133,332, Cl. 123-198.00F.
Berard, Louis N.; Hollmann, Alfred G.; and Stein, Leonard A., to Devices Development Corporation. Safety mechanism for highway exit ramp. 4,133,140, Cl. 49-49.000.
Berman, Edward J.; and Rowe, George A. Method and apparatus for reducing obesity. 4,133,315, Cl. 128-303.00R.
Bernardelli, William J.; Caudill, Allison H.; and Thompson, John A., to International Business Machines Corporation. Optimum preclean corona current for eliminating the accumulation of contaminants from developers. 4,133,610, Cl. 355-3.0CH.
Bernardi, Luigi: *See—*
Masi, Paolo; Suarato, Antonino; Giardino, Pietro; Bernardi, Luigi; and Arcamone, Federico, 4,133,877, Cl. 424-180.000.
Bernhard, Heinz O.: *See—*
Thiele, Kurt; and Bernhard, Heinz O., 4,133,903, Cl. 426-590.000.
Bernstein, Richard; and Matriss, Joseph P. Artificial modular denture. 4,133,110, Cl. 32-2.000.
Berry, Robert A. Palatal exerciser control device. 4,133,306, Cl. 128-64.000.
Berthelot, Daniel, to S. A. Martin. Stacking device for sheets. 4,133,523, Cl. 271-182.000.
Berthet, Michel; Gillet, Roger; Marquet, Andre; and Moisson-Franckhauser, Francois, to Alsthom-Atlantique; and Electricite de France - Service National. Current lead-in device for superconducting rotary electrical machines. 4,134,037, Cl. 310-52.000.
Bertorelli, Orlando L.; and Fitton, Robert C., to J. M. Huber Corporation. Method for reducing aggregate size. 4,133,694, Cl. 106-288.00B.
Best, Eddie R.: *See—*
Keller, Alex J., Jr.; and Best, Eddie R., 4,133,168, Cl. 57-304.000.
Bevan, Alfred R.; and Stephens, Ian, to Malaysian Rubber Producers' Research Association. Production of rubber tubing from latex. 4,133,623, Cl. 425-133.100.
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Beyer, Douglas E.: *See—*
West, Robert C.; Beyer, Douglas E.; and Komatsu, Koichi, 4,133,821, Cl. 260-396.00N.
Bianchi, Valerio; and Latsch, Reinhard, to Robert Bosch GmbH. Apparatus for determining the injected fuel quantity in mixture compressing internal combustion engines. 4,133,320, Cl. 123-32.0EA.

Bingham, Thomas G., to SWS Silicones Corporation. Primer compositions for silicone elastomers. 4,133,938, Cl. 428-447.000.
Binks Manufacturing Company: *See*—
Henderson, David, 4,133,483, Cl. 239-118.000.
Birch, Ivan J.; and Mills, David, to Rolls-Royce Limited. Casting. 4,133,371, Cl. 164-350.000.
Biskup, Edward J., to General Motors Corporation. Cambering device for cambering vehicle. 4,133,551, Cl. 280-221.000.
Bivins, Henry W., Jr. Method of flow stabilization in a tube and shell vaporizer. 4,133,184, Cl. 62-49.000.
Black, David L. Carburetion device. 4,133,848, Cl. 261-41.00B.
Black and Decker Manufacturing Company, The: *See*—
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Blahak, Johannes; Wagner, Kuno; Mazanek, Jan; and Haas, Peter, to Bayer Aktiengesellschaft. Process for the production of polyurethane elastomers and foams. 4,133,943, Cl. 521-163.000.
Blanchard, William B.; and Ryan, Charles W., to Eli Lilly and Company. Preparation of cis-1-hydroxy-3-substituted-6,6-dimethyl-6,6a,7,8,10,10a-hexahydro-9H-dibenzo[b,d]pyran-9-ones and intermediates therefor. 4,133,816, Cl. 260-340.700.
Blanin, Valentin A.: *See*—
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Blessing, Hubert, to Levi Strauss & Co. Intermittent drive and transfer mechanism. 4,133,217, Cl. 74-395.000.
Bliley, Ward L.: *See*—
Wiltshire, Arthur J.; Nara, Harry R.; LeBreton, Edward T.; and Bliley, Ward L., 4,133,442, Cl. 220-5.00R.
Bliss, John H. Entry, display and use of data employed to overcome aircraft control problems due to wind shear. 4,133,503, Cl. 244-188.000.
Blomquist, Alfred P., to Chrysler Corporation. Semi-automatic transmissions. 4,133,224, Cl. 74-750.00R.
Bloom, Stanley M., to Polaroid Corporation. Dichroic light polarizers stained with metal chelates. 4,133,775, Cl. 252-300.000.
Bloom, William G.; Choksi, Pradip V.; and Spaeth, Edmund E., to American Hospital Supply Corporation. Extension transfer set. 4,133,314, Cl. 128-272.300.
Bloomfield, Ellis L. Can supported ashtray. 4,133,319, Cl. 131-241.000.
Blore, James H.; and Balcombe, Bobby L., to Phillips Fibers Corporation. Knitted fabric having open areas. 4,133,191, Cl. 66-197.000.
Blu-Surf, Inc.: *See*—
Flynn, Charles S., 4,133,636, Cl. 432-72.000.
Blumbergs, John H.; and Scholer, Fred R., to FMC Corporation. Oxybis(diacyloxyboranes) as peroxygen activators. 4,133,637, Cl. 8-107.000.
Blunt, Harry W., to Hercules Incorporated. Coated bottles. 4,133,923, Cl. 428-35.000.
Boehringer Ingelheim GmbH: *See*—
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Boehringer Mannheim GmbH: *See*—
Batz, Hans-Georg; Linke, Hans-Ralf; Stellner, Klaus; and Weimann, Gunter, 4,133,949, Cl. 536-7.000.
Boeing Commercial Airplane Company: *See*—
Falcioni, Joseph G., 4,133,096, Cl. 29-522.00A.
Boeing Company, The: *See*—
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Boeke, Jan. Combination electrode system. 4,133,732, Cl. 204-195.00G.
Boie, Immo; Kuffner, Karl; Kirchhoff, Gertrud; and Schranz, Karl-Wilhelm, to AGFA-Gevaert Aktiengesellschaft. 2-Equivalent yellow couplers. 4,133,958, Cl. 548-321.000.
Bokerman, Gary N.; and Gordon, David J., to Dow Corning Corporation. Method for applying a silicone release coating and coated article therefrom. 4,133,939, Cl. 428-447.000.
Bolger, Thomas V., to RCA Corporation. Direct digital frequency synthesizer. 4,134,072, Cl. 328-14.000.
Bolhofer, William A.; Cragoe, Edward J., Jr.; and Hoffman, Jacob M., Jr., to Merck & Co., Inc. Substituted naphthyridinones. 4,133,885, Cl. 424-256.000.
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Lewis, George E.; and Bollfrass, Charles A., 4,133,095, Cl. 29-458.000.
Bolton, Ellis T.; and Dey, Noel D., to University of Delaware. Process for marking molluscs. 4,133,294, Cl. 119-4.000.
Bongiorno, Domenico. Railway safety system using intensity of current. 4,133,505, Cl. 246-167.00D.
Boosen, Karl-Josef, to Lonza Ltd. Process for the production of α-cyano-γ-haloacetoacetic compounds. 4,133,827, Cl. 260-465.400.
Boots Company Limited, The: *See*—
Healey, Dennis R., 4,133,638, Cl. 422-32.000.
Boret, Roger; Bronner, Charles; Huin, Roland; and Vidal, Andre, to Institut Francais du Petrole. Moving bed catalytic process for hydrocarbon conversion. 4,133,743, Cl. 208-64.000.
Borg-Warner Corporation: *See*—
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Sahajpal, Ved K.; Sarver, Larry D.; and Deegan, Claude C., 4,133,788, Cl. 260-29.7UP.
Bory, Barbara H.; and Kessler, Alan B., to Lever Brothers Company. Water purification device. 4,133,754, Cl. 210-36.000.
Bose Corporation: *See*—
Barker, Charles R., III, 4,133,975, Cl. 179-1.00E.
Bott, John A. Adjustable vehicle article carrier. 4,133,465, Cl. 224-42.10D.
Boubela, Lubomir: *See*—
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Bouchet, Bernard, to Etablissements Leon Goiffon. Inviolable closing device for containers. 4,133,447, Cl. 220-258.000.
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Bourrian, Isaac. Shirt collar support. 4,133,463, Cl. 223-83.000.
Bouvet, Jean: *See*—
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Bouvin, Jacques, to Esso Societe Anonyme Francaise. Atomizer and uses thereof. 4,133,485, Cl. 239-399.000.
Bowers, Donald R.: *See*—
Boyd, Wilton E.; and Bowers, Donald R., 4,133,971, Cl. 174-46.000.
Bowes, Quentin; Haase, Jaroslav; and Wurster, Rudolf F., to Ciba-Geigy Corporation. Ionically modified cellulose materials for removal of heavy metal ions. 4,133,929, Cl. 428-260.000.
Boyd, Wilton E.; and Bowers, Donald R., to Hoover Company, The. Hand grip mounted switch and strain relief. 4,133,971, Cl. 174-46.000.
Boyer, Jean-Jacques. Ballast cleaning and levelling machine. 4,133,388, Cl. 171-16.000.
Boyer, Rolla J.: *See*—
Janian, Robert; and Boyer, Rolla J., 4,133,542, Cl. 277-152.000.
Bozik, John E.: *See*—
Pretzer, Wayne R.; Kobylinski, Thaddeus P.; and Bozik, John E., 4,133,966, Cl. 568-902.000.
Bradley, Robert W., to Bush Universal, Inc. Stiffener for shoes or the like. 4,133,117, Cl. 36-76.00C.
Brandberg, Lawrence C.: *See*—
Standing, Charles N.; and Brandberg, Lawrence C., 4,133,896, Cl. 426-107.000.
Brandt Industries, Inc.: *See*—
Brandt, Robert O., Jr., 4,133,213, Cl. 73-756.000.
Brandt, Robert O., Jr., to Brandt Industries, Inc. Static air pressure diffuser. 4,133,213, Cl. 73-756.000.
Branscome, Kenneth M.; Morgan, Barrie O.; and Carter, Merlon B., to Datotek, Inc. Digital cryptographic system having synchronous and asynchronous capabilities. 4,133,973, Cl. 178-22.000.
Brant, Alberto: *See*—
Re, Luciano; Brant, Alberto; and Bassignani, Luciano, 4,133,807, Cl. 260-239.00A.
Bratton, David: *See*—
Fermi, Rudy; Pickard, John; Kocsis, Alex; Bratton, David; and Kasner, Gerald, 4,133,264, Cl. 101-415.100.
Braun, Dieter, to Felten & Guilleaume Carlswerk AG. Apparatus for molding insulating disks on coaxial-cable wire. 4,133,622, Cl. 425-129.00R.
Brennan, John L. Pneumatic springing shoe. 4,133,086, Cl. 36-7.800.
Bresch, Hans Ulrich: *See*—
Thiele, Paul; and Bresch, Hans Ulrich, 4,134,086, Cl. 333-27.000.
Brewer, Richard J.; Grant, Peter M.; and Taylor, Robert B., to Eastman Kodak Company. Thermosetting cellulose ester powder coating composition. 4,133,783, Cl. 260-15.000.
Brewer, Terry L., to Texas Instruments Incorporated. High resolution electron beam resist. 4,133,907, Cl. 427-43.000.
Bright, James A.; and Clark, Gene H., to Hathaway Instruments, Inc. Analog signal delay system and method. 4,134,029, Cl. 307-293.000.
Briskin, Theodore S., to Philip Morris Incorporated. Smokable material and method for preparing same. 4,133,317, Cl. 131-2.000.
British Gas Corporation: *See*—
Stroud, Henry J. F.; and Tart, Kenneth R., 4,133,825, Cl. 260-449.00M.
British Hovercraft Corporation Limited: *See*—
Cockerell, Christopher, 4,133,282, Cl. 114-67.00A.
British Petroleum Company Limited, The: *See*—
Cray, Daniel G., 4,133,200, Cl. 73-10.000.
Bronner, Charles: *See*—
Boret, Roger; Bronner, Charles; Huin, Roland; and Vidal, Andre, 4,133,743, Cl. 208-64.000.
Brook, Richard M., to AutoSystems Limited. Apparatus for sorting successive articles moving along a path. 4,133,098, Cl. 209-565.000.
Brooks, Frank W., Sr., to General Motors Corporation. Quick take-up master cylinder. 4,133,178, Cl. 60-578.000.
Brown, Jimmy W.: *See*—
Clinton, Russell M.; Taylor, A. Allilee; and Brown, Jimmy W., 4,133,640, Cl. 23-230.0PC.
Brown, Lawrence G. Bicycle and power transmission system. 4,133,550, Cl. 280-210.000.
Brown, Marvin R.: *See*—
Vale, Wylie W., Jr.; Rivier, Jean E. F.; and Brown, Marvin R., 4,133,782, Cl. 260-8.000.
Browne, Frederick S.: *See*—
Sarson, Charles R.; and Browne, Frederick S., 4,133,564, Cl. 285-321.000.
Brucken, Byron L.; and Hodits, Frank W., Jr., to General Motors Corporation. Combined electrical cut-off and relief valve. 4,133,186, Cl. 62-228.000.
Brush, Clyde E. Safety device for rifles. 4,133,128, Cl. 42-70.00R.
Brynko, Carl; and Brynko, Carl G., to Reprographic Materials, Inc. Process for preparing direct imaging pressure fixable magnetic toners. 4,133,774, Cl. 252-62.10D.
Brynko, Carl G.: *See*—
Brynko, Carl; and Brynko, Carl G., 4,133,774, Cl. 252-62.10D.
Bschorr, Oskar; and Albrecht, Helmut, to Messerschmitt-Boelkow-

Blohm Gesellschaft mit beschraenkter Haftung. Damper for sound conducted in solids. 4,133,157, Cl. 52-403.000.
BSR Limited: *See*—
Evans, Phillip H., 4,133,539, Cl. 274-1.00L.
Bucher-Guyer AG, Maschinenfabrik: *See*—
Hauser, Hans U., 4,133,850, Cl. 261-93.000.
Buck, Ronald G., to Litton Systems, Inc. Method of fire detection in a microwave oven. 4,133,995, Cl. 219-10.55M.
Budny, Thomas J., to Xerox Corporation. Toner dispenser arrangement. 4,133,458, Cl. 222-228.000.
Bullman, Allan R., to Union Carbide Corporation. High temperature resistant hot melt sealant. 4,133,796, Cl. 260-37.0EP.
Bultman, John D.; Ritchie, Donald D.; and Jurd, Leonard, to United States of America, Navy. Method of inhibiting and/or eradicating marine fungal growth with obtusastyrene. 4,133,862, Cl. 422-28.000.
Bunyard, Alan D.: *See*—
Norris, Kenneth W.; Bunyard, Alan D.; and Marchant, Derek N., 4,133,215, Cl. 74-89.000.
Burd, Samuel, to Cordis Dow Corp. Connector for attachment of blood tubing to external arteriovenous shunts and fistulas. 4,133,312, Cl. 128-214.00R.
Burda, Robert E.: *See*—
Richardson, Raymond W.; Burda, Robert E.; and Crumrine, John C., 4,133,391, Cl. 172-311.000.
Burgess, Colin H., to Dynamic Controls Limited. Device for indicating the operative position of a valve. 4,133,288, Cl. 116-277.000.
Burke, Francis P., to Continental Oil Co.; and United States of America, Energy. Method for pelletizing carbonaceous solids. 4,133,647, Cl. 44-24.000.
Burress, George T., to Mobil Oil Corporation. Phosphate flotation process. 4,133,750, Cl. 209-166.000.
Burroughs Corporation: *See*—
Beery, Jack, 4,133,262, Cl. 101-350.000.
Costello, Matthew J.; Saunders, Thomas K.; and DeLuca, Albert M., 4,134,136, Cl. 358-291.000.
Ragle, Herbert U.; and DeMoss, Dean L., 4,134,143, Cl. 360-98.000.
Ragle, Herbert U.; and DeMoss, Dean L., 4,134,144, Cl. 360-133.000.
Burton, Fred, Jr.; Gartenlaub, Marshall N.; and Sampsel, Kenneth E., to Home Metal Products Company. Ventilating range hood. 4,133,300, Cl. 126-299.00D.
Burton, Robert S., III; Chambers, Carlon C.; and Hughes, Robert F., to Occidental Oil Shale. Establishing a combustion zone below a sill pillar in an in situ oil shale retort. 4,133,380, Cl. 166-259.000.
Burvall, Sten B. Connecting element. 4,133,151, Cl. 52-93.000.
Bush Universal, Inc.: *See*—
Bradley, Robert W., 4,133,117, Cl. 36-76.00C.
Butt, William C., to Simplimatic Engineering Company. Partition positioner. 4,133,253, Cl. 93-37.00R.
Byrd, Michael D.; and Scott, August R., to Farmland Industries, Inc. Method of preparing liquid monoammonium phosphate fertilizer suspension. 4,133,670, Cl. 71-34.000.
Byrum, Bernard W., Jr.: *See*—
Fein, Michael E.; Byrum, Bernard W., Jr.; and Ernsthausen, Roger E., 4,133,934, Cl. 428-336.000.
C.F. Spiess & Sohn: *See*—
Perkow, Werner; Hopp, Hans; Ingwersen, Walter; and C.F. Spiess & Sohn, 4,133,892, Cl. 424-300.000.
C. Friedr. Tillmanns KG: *See*—
Kolloch, Hardy; Tillmanns, Karl-Friedrich; Tillmanns, Hans W.; and Tillmanns, Gunter, 4,133,362, Cl. 145-24.000.
C.G.R.-MeV: *See*—
Azam, Guy; and Perraudin, Claude, 4,134,017, Cl. 250-398.000.
Calaway, Ward M.: *See*—
Wright, Charles E.; and Calaway, Ward M., 4,134,140, Cl. 360-67.000.
Calbeck, J. R., Trustee: *See*—
Calbeck, John H., 4,133,865, Cl. 423-106.000.
Calbeck, John H., to Calbeck, J. R., Trustee, W. J. Trust. Process for preparing metallic sulphates. 4,133,865, Cl. 423-106.000.
Calbiochem Behring Corp.: *See*—
Spangler, Arthur S., deceased, 4,133,893, Cl. 424-354.000.
Calder, Brooke J., Jr.; Childs, David L.; Prescott, Roger N.; and Lyons, Donald W., to Austin Powder Company. Carrier for explosive primer and method of using same. 4,133,247, Cl. 86-20.00C.
Caldwell, Bob L.; and Fletcher, Ronald B., to Agri-Prassco Joint Venture; and Agri-Sul Equipment, part interest to each. Process for pelletizing a sulphur-bentonite clay mixture and the product formed thereby. 4,133,669, Cl. 71-3.000.
Cale, Albert D., Jr.; and Jenkins, Herndon, to A. H. Robins Company, Incorporated. Azetidinyl acetonitrile and acetamide antiarrhythmia compositions and methods. 4,133,881, Cl. 424-244.000.
Callewyn, Leo R. Industrial dust collection system and apparatus. 4,133,658, Cl. 55-315.000.
Cambria Spring Company: *See*—
Lampert, Albert J., 4,133,554, Cl. 280-689.000.
Campioni, Armando, to Indesit Industria Elettrodomestici Italiana S.p.A. Color television signal including auxiliary information. 4,134,127, Cl. 358-16.000.
Campisano, Fred M. Hinge arrangement. 4,133,143, Cl. 49-388.000.
Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence in Her Majesty's Canadian Government: *See*—
Feldman, Keiva, 4,134,060, Cl. 324-29.500.
Canadian Patents & Development Limited: *See*—
Visman, Jan, 4,133,747, Cl. 209-10.000.
Cannon, John G.; Scott, Daniel G.; and Mong, William K., to Westinghouse Air Brake Company. Hose coupling. 4,133,561, Cl. 285-68.000.
Cannon, William L.: *See*—
Kelly, Ronald D.; and Cannon, William L., 4,134,077, Cl. 330-69.000.
Canon Kabushiki Kaisha: *See*—
Hosoe, Kazuya; Asaeda, Tsuyoshi; Yokota, Hideo; and Shingu, Tamotsu, 4,133,606, Cl. 354-25.000.
Kohtani, Yutaka, 4,134,079, Cl. 330-281.000.
Canonne, Jacques E., to Corexi S.A. Process for the manufacture of cooked sugar pastilles. 4,133,905, Cl. 426-660.000.
Cantu, Arthur M.: *See*—
Koontz, Paul G.; Wright, Richard L.; and Cantu, Arthur M., 4,134,019, Cl. 250-439.00R.
Capio, Cesar D.: *See*—
Adams, Arthur C.; Capio, Cesar D.; Levinstein, Hyman J.; and Murarka, Shyam P., 4,134,125, Cl. 357-54.000.
Carando Machine Works: *See*—
Allen, Howard, 4,133,197, Cl. 72-15.000.
Carbajal, Bernard G.: *See*—
Chiang, Shang-Yi; and Carbajal, Bernard G., 4,133,698, Cl. 136-89.0SJ.
Cardot, Claude R.; Droux, Jacques P.; and Oisel, Andre J., to Compagnie Internationale pour l'Informatique Cii Honeywell Bull. Method of reading addresses on a magnetic recording medium and apparatus for putting it into effect. 4,134,138, Cl. 360-39.000.
Carl Hasse & Wrede GmbH: *See*—
Studinger, Ernst, 4,133,232, Cl. 82-36.00A.
Carl Schenck AG, Firma: *See*—
Klinger, Friedrich, 4,133,201, Cl. 73-12.000.
Carl Still Recklinghausen, Firma: *See*—
Choulat, Gustav; Lorenz, Kurt; and Petsch, Egon, 4,133,643, Cl. 422-182.000.
Carlo Erba S.p.A.: *See*—
Gandolfi, Carmelo; Doria, Gianfederico; and Gaio, Pietro, 4,133,829, Cl. 562-503.000.
Carlson, Casey L., to Sico Incorporated. Folding table with locking hinge. 4,133,271, Cl. 108-113.000.
Carlson, Robert A.; Roberts, Robert L.; and Farkas, Daniel F., to United States of America, Agriculture. Process for preparing quick-cooking rice. 4,133,898, Cl. 426-462.000.
Carmann, Fritz: *See*—
Jelinek, Heinz; and Carmann, Fritz, 4,133,129, Cl. 42-89.000.
Carnahan, David A. Method of replacing seals in a well ram type blow out preventer. 4,133,342, Cl. 137-15.000.
Caron, Charles. Electronic ignition device for internal combustion engines. 4,133,329, Cl. 123-148.0CB.
Carrico, Arnold J. Method of making flexible multi-columnar fluid treatment cellular apparatus. 4,133,709, Cl. 156-197.000.
Carrier Corporation: *See*—
Goranson, Paul L., 4,133,439, Cl. 214-505.000.
Liberman, Harvey W.; and Salyers, John C., 4,133,438, Cl. 214-310.000.
Carroll, Luther E., to General Motors Corporation. Valve assembly for a brake system. 4,133,343, Cl. 137-116.500.
Carter, Carl W., to Caterpillar Tractor Co. Control apparatus. 4,133,218, Cl. 74-471.0XY.
Carter, David: *See*—
Augstein, Joachim; Carter, David; and Lee, Thomas B., 4,133,889, Cl. 424-269.000.
Carter, Merlon B.: *See*—
Branscome, Kenneth M.; Morgan, Barrie O.; and Carter, Merlon B., 4,133,973, Cl. 178-22.000.
Cartwright, David; and Urlwin-Smith, Philip L., to Imperial Chemical Industries Limited. Herbicidal heterocyclic compounds. 4,133,674, Cl. 71-93.000.
Cartwright, John N., to General Motors Corporation. Back-up torque transmitting structure. 4,133,188, Cl. 64-13.000.
Casals, Jose B., to Aktieselskabet Rosco. Process for producing stable solutions of a sulphonamide and a potentiator. 4,133,879, Cl. 424-229.000.
Casey, William J.: *See*—
Miller, George E.; and Casey, William J., 4,134,107, Cl. 340-381.000.
Casio Computer Co., Ltd.: *See*—
Kashio, Toshio, 4,133,170, Cl. 58-42.500.
Casset, Jacques G., to Strateurop S.A. Reel holder. 4,133,133, Cl. 43-22.000.
Cataldo, Roy S., to General Motors Corporation. Modified Ericsson cycle engine. 4,133,172, Cl. 60-39.630.
Caterpillar Tractor Co.: *See*—
Agge, Richard W.; and Kelly, Kenneth W., 4,133,251, Cl. 91-521.000.
Allen, Royce D.; and Oestmann, Eldon D., 4,133,401, Cl. 180-9.500.
Carter, Carl W., 4,133,218, Cl. 74-471.0XY.
Freese, Gary P., 4,133,392, Cl. 172-809.000.
Girard, William T.; Richardson, Warner G.; and Wilson, Eugene M., 4,133,122, Cl. 37-126.0AE.
Huxtable, James T.; Miller, Robert G.; and Robinson, Tommy E., 4,134,103, Cl. 340-146.1AB.
Lorimor, Larry W., 4,133,510, Cl. 251-31.000.
Caudill, Allison H.: *See*—
Bernardelli, William J.; Caudill, Allison H.; and Thompson, John A., 4,133,610, Cl. 355-3.0CH.
Celanese Corporation: *See*—
Meyer, Paul L., 4,133,513, Cl. 251-306.000.

Celotex Corporation, The: *See—*
Beale, John H.; and Moss, Ernest K., 4,133,931, Cl. 428-315.000.
Ceskoslovenska akademie ved: *See—*
Coupek, Jiri; and Gut, Vladimir, 4,133,942, Cl. 521-147.000.
CGEE Alsthom: *See—*
Debaigt, Jean, 4,133,597, Cl. 339-125.00R.
Chadha, Naresh K.; Partridge, John J., Jr.; and Uskokovic, Milan R., to Hoffmann-La Roche Inc. Process for producing lactones. 4,133,818, Cl. 260-343.30P.
Chamberlain Manufacturing Corporation: *See—*
Curb, Walter R., 4,133,411, Cl. 182-2.000.
Chambers, Carlon C.: *See—*
Burton, Robert S., III; Chambers, Carlon C.; and Hughes, Robert F., 4,133,380, Cl. 166-259.000.
Champion International Corporation: *See—*
Wright, John T.; and Wolfe, Kevin A., 4,133,930, Cl. 428-315.000.
Chang, Dora D. J.: *See—*
Chang, Karl; and Chang, Dora D. J., 4,133,124, Cl. 40-408.000.
Chang, Karl; and Chang, Dora D. J. Display device. 4,133,124, Cl. 40-408.000.
Chapman, Thomas M., to Mettoy Company Limited, The. Toy kites. 4,133,500, Cl. 244-153.00R.
Chappell, Max G. Multi-level chess board. 4,133,537, Cl. 273-241.000.
Charlton, John C.; and Hamilton, Alan L., to Radiochemical Centre Limited, The. Vitamin B-12 cobalt-57 and process. 4,133,951, Cl. 536-25.000.
Chateau, Georges M., to Societe Nationale Elf Aquitaine (Production). Apparatus and method of connecting a flowline to a subsea station. 4,133,182, Cl. 405-169.000.
Chauvin, Yves: *See—*
Cosyns, Jean; Chauvin, Yves; Juguin, Bernard; Le Page, Jean-Francois; and Miquel, Jean, 4,133,841, Cl. 260-676.00R.
Chembro Holdings (Proprietary) Limited: *See—*
Lourens, Gerhardus J.; and Koekemoer, Johannes M., 4,133,817, Cl. 260-340.90P.
Lourens, Gerhardus J.; Koekemoer, Johannes M.; and Venter, Elise M. M., 4,133,948, Cl. 536-1.000.
Chemische Werke Huels Aktiengesellschaft: *See—*
Kalka, Josef; Winter, Hermann; and Kania, Alfred, 4,133,947, Cl. 528-502.000.
Chemoprojekt, projektova: *See—*
Polak, Josef; Boubela, Lubomir; and Mrazek, Josef, 4,133,734, Cl. 204-195.00C.
Chen, Tsang J.; and McLaen, Donald F., to Eastman Kodak Company. Photographic elements having hydrophilic colloid layers containing compounds having activator precursors and hydrophobic developing agents uniformly loaded in latex polymer particles. 4,133,687, Cl. 96-76.00R.
Cheng, Fred F. Fishing lure. 4,133,134, Cl. 43-42.060.
Chervenak, Robert A., to Comerco, Inc. System for mounting storage units. 4,133,507, Cl. 248-225.200.
Chevron Research Company: *See—*
Mitchell, David S.; and Sageman, David R., 4,133,739, Cl. 208-8.000.
Chiang, Shang-Yi; and Carbajal, Bernard G., to Texas Instruments Incorporated. Tandem junction solar cell. 4,133,698, Cl. 136-89.0SJ.
Chicago Bridge & Iron Company: *See—*
Stafford, Donald C., 4,133,094, Cl. 29-447.000.
Chierici, Osvaldo F., to Holland Company. Snap-on coupler bearing plate for railroad car coupler carriers. 4,133,434, Cl. 213-61.000.
Childs, David L.: *See—*
Calder, Brooke J., Jr.; Childs, David L.; Prescott, Roger N.; and Lyons, Donald W., 4,133,247, Cl. 86-20.00C.
Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt.: *See—*
Szaantay, Csaba; Rohaaly, Jaanos; and Jelinek, Istvaan, 4,133,812, Cl. 546-96.000.
Chismar, Michael T., to General Electric Company. Electromagnet for an extremely inverse time overcurrent protective relay. 4,134,089, Cl. 335-225.000.
Chisso Corporation: *See—*
Takano, Masaaki; and Nakajima, Masahiro, 4,133,857, Cl. 264-120.000.
Tarao, Ryohkichi; Kaku, Kanji; Hayashi, Masaki; Nakamura, Takao; Ohishi, Shigeo; and Yamano, Hajime, 4,133,755, Cl. 210-38.00B.
Choksi, Pradip V.: *See—*
Bloom, William G.; Choksi, Pradip V.; and Spaeth, Edmund E., 4,133,314, Cl. 128-272.300.
Choulat, Gustav; Lorenz, Kurt; and Petsch, Egon, to Carl Still Recklinghausen, Firma. Method and apparatus for decomposing ammonia fumes having a high hydrogen sulfide content. 4,133,643, Cl. 422-182.000.
Christensen, Inc.: *See—*
Jurgens, Rainer, 4,133,516, Cl. 267-125.000.
Chromalloy American Corporation: *See—*
Trail, Melvin P., 4,133,470, Cl. 228-44.10R.
Chrysler Corporation: *See—*
Blomquist, Alfred P., 4,133,224, Cl. 74-750.00R.
Chrysler, Richard R. Hatch for vehicle roofs. 4,133,576, Cl. 296-137.00B.
Chuang, Strong C., to Procter & Gamble Company, The. Microturbulence generator for papermachine headbox. 4,133,713, Cl. 162-216.000.
Chuwman, Tsutomu: *See—*
Ishikawa, Masakazu; and Chuwman, Tsutomu, 4,133,560, Cl. 285-81.000.
Ciba-Geigy AG: *See—*
Lamb, Frank, 4,133,794, Cl. 260-31.600.
Ciba-Geigy Corporation: *See—*
Bowes, Quentin; Haase, Jaroslav; and Wurster, Rudolf F., 4,133,929, Cl. 428-260.000.
Mueller, Karl F., 4,133,820, Cl. 260-346.740.
Schurter, Rolf; and Rempfler, Hermann, 4,133,675, Cl. 71-94.000.
Sturm, Elmar, 4,133,954, Cl. 544-101.000.
Wheeler, Ian R.; and Robertson, George H., 4,133,695, Cl. 106-288.00Q.
Cicala, Dario, to Seas di Grissino & C.S.a.S. Keyboard for presetting the tuning of a radio receiving apparatus. 4,133,214, Cl. 74-10.310.
Cincinnati Milacron Inc.: *See—*
Kellermann, Arnold L.; and McDonald, David I., 4,133,625, Cl. 425-394.000.
Clapper, Terry L. Adjustable support structure for releasably positioning an article. 4,133,518, Cl. 269-91.000.
Clark, Gene H.: *See—*
Bright, James A.; and Clark, Gene H., 4,134,029, Cl. 307-293.000.
Clark, William C., to Phillips Petroleum Company. Combustion system control. 4,133,629, Cl. 431-12.000.
Clary, Harry E., to TRW, Inc. Rack gear and method of making the same. 4,133,221, Cl. 74-498.000.
Clinton, Russell M.; Taylor, A. Allilee; and Brown, Jimmy W., to Gulf Oil Corporation. Chromatographic analysis apparatus. 4,133,640, Cl. 23-230.0PC.
Clutter, Melvin E.: *See—*
West, Edward L.; and Clutter, Melvin E., 4,133,591, Cl. 339-14.00L.
Coastal Engineered Products Company, Inc.: *See—*
DeLoach, Thomas R.; and Kusek, Walter W., 4,134,120, Cl. 343-715.000.
Cobaugh, Robert F.; Dowling, Edward C.; and Taylor, Attalee S., to AMP Incorporated. Stacked printed circuit boards and circuit board system. 4,133,592, Cl. 339-17.00M.
Cockerell, Christopher, to British Hovercraft Corporation Limited. Cushion seals for air cushion vehicles. 4,133,282, Cl. 114-67.00A.
Coenenberg, Heinrich: *See—*
Huda, Josef; Coenenberg, Heinrich; and Aubry, Friedhelm, 4,133,198, Cl. 72-321.000.
Cole, Charles. Bingo card holding and marking device. 4,133,536, Cl. 273-240.000.
Colgate-Palmolive Company: *See—*
Fischer, Charles F., 4,133,431, Cl. 206-532.000.
Collins, Edward J.; and Sterling, Vaughn C., to General Electric Company. Photoflash lamp array circuit board having radiation sensitive fuse elements. 4,133,631, Cl. 431-359.000.
Collins, Joseph C.; and Diana, Guy D., to Sterling Drug Inc. Aryloxyalkyl diketones. 4,133,959, Cl. 560-53.000.
Collins, Paul D., to Haverhill Meat Products Limited. Meat tenderizing apparatus. 4,133,075, Cl. 17-26.000.
Colt Industries Operating Corp.: *See—*
Bell, Oliver A., Jr.; Gilleland, Randall C.; and Barker, Jeter O., 4,134,000, Cl. 219-69.00C.
Combustion Engineering, Inc.,: *See—*
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Comerco, Inc.: *See—*
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Commissariat a l'Energie Atomique: *See—*
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Commonwealth Industrial Gases Limited, The: *See—*
McGrath, John A.; and Robertson, Murray R., 4,133,302, Cl. 128-1.00B.
Commonwealth Scientific and Industrial Research Organization: *See—*
Esdaile, James D.; and Walters, Graeme W., 4,133,517, Cl. 266-200.000.
Communications Satellite Corporation: *See—*
Meulenberg, Andrew, Jr., 4,133,699, Cl. 136-89.0CC.
Pentlicki, Chester J., 4,133,501, Cl. 244-173.000.
Compagnie Francaise des Petroles: *See—*
Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., 4,133,180, Cl. 405-170.000.
Walker, Raymond W.; and Beard, Robert M., 4,133,992, Cl. 200-81.00R.
Compagnie Generale des Etablissements Michelin: *See—*
Durand, Pierre, 4,133,940, Cl. 429-12.000.
Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines (Doris): *See—*
Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., 4,133,180, Cl. 405-170.000.
Compagnie Internationale pour l'Informatique Cii Honeywell Bull: *See—*
Cardot, Claude R.; Droux, Jacques P.; and Oisel, Andre J., 4,134,138, Cl. 360-39.000.
Compagnie Maritime d'Expertises: *See—*
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Compair Construction and Mining Limited: *See—*
Richards, Ernest J., 4,133,393, Cl. 173-64.000.
Computervision Corporation, The: *See—*
Simms, Douglas P.; White, Anthony F.; and Miller, Carl W., 4,133,918, Cl. 427-256.000.
Conibear, Frank R., to Woodstream Corporation. Rotating frame animal trap with improved trigger. 4,133,136, Cl. 43-92.000.

Continental Oil Co.: *See—*
Burke, Francis P., 4,133,647, Cl. 44-24.000.
Ziegenhain, William C.; Poe, Ronald L.; Bendig, Larry L.; and Scamehorn, John F., 4,133,871, Cl. 423-628.000.
Coons, Scott. Bubble forming and projecting device. 4,133,138, Cl. 46-6.000.
Cooper, Allen K.: *See—*
Honikman, Terence C., 4,133,338, Cl. 126-271.000.
Cooper Industries, Inc.: *See—*
Curtiss, George R., 4,134,036, Cl. 310-42.000.
DeSaw, Fred A., 4,133,469, Cl. 228-7.000.
Cooper, Richard R.; and Whiteley, Kenneth S., to Imperial Chemical Industries Limited. Ethylene polymerization. 4,133,944, Cl. 526-65.000.
Cooper, Robin D. G.; and Spry, Douglas O., to Eli Lilly and Company. 4-(Formylthio)azetidinones and ozonization process therefor. 4,133,808, Cl. 260-239.00A.
Cooper, Roydon B., to Pall Corporation. Filter assembly with replaceable filter element. 4,133,763, Cl. 210-232.000.
Cope, Steven A., to Du Pont de Nemours, E. I., and Company. Electrolytic cell with switching means. 4,133,728, Cl. 204-68.000.
Cops, Michael H.; and Sainsbury, Clive R., to Lucas Industries, Ltd. Fuel control system for an internal combustion engine. 4,133,326, Cl. 123-119.0EC.
Copylite, Inc.: *See—*
McManus, John W., 4,133,420, Cl. 194-9.00T.
Corbett, Brian D., to U.S. Philips Corporation. Aircraft antenna-switching arrangements. 4,134,118, Cl. 343-112.00S.
Cordell, James L.: *See—*
Russell, Duane K.; and Cordell, James L., 4,133,176, Cl. 60-327.000.
Cordis Dow Corp.: *See—*
Burd, Samuel, 4,133,312, Cl. 128-214.00R.
Cordotex SA: *See—*
Wartenberg, Erwin W., 4,133,710, Cl. 156-244.270.
Corexi S.A.: *See—*
Canonne, Jacques E., 4,133,905, Cl. 426-660.000.
Corini, Louis J. Temperature-controlled liquid dispenser. 4,133,456, Cl. 222-146.0HE.
Cornell Research Foundation, Inc.: *See—*
Kosikowski, Frank V.; and Jolly, Ramesh C., 4,133,895, Cl. 426-33.000.
Corning Glass Works: *See—*
Bartholomew, Roger F.; Haynes, William L.; and Sanford, Leon M., 4,133,665, Cl. 65-30.00E.
Corona, Richard. Lathe turning fixture. 4,133,231, Cl. 82-28.00R.
Cosquer, Philippe: *See—*
Warnant, Julien; Marechal-Prost, Jacques; and Cosquer, Philippe, 4,133,826, Cl. 260-465.00D.
Costello, Matthew J.; Saunders, Thomas K.; and DeLuca, Albert M., to Burroughs Corporation. Paper carrier for facsimile machine. 4,134,136, Cl. 358-291.000.
Cosyns, Jean; Chauvin, Yves; Juguin, Bernard; Le Page, Jean-Francois; and Miquel, Jean, to Institut Francais du Petrole. Process for upgrading effluents from syntheses of the Fischer-Tropsch type. 4,133,841, Cl. 260-676.00R.
Coulter Systems Corporation: *See—*
Kuehnle, Manfred R., 4,133,906, Cl. 427-17.000.
Coupek, Jiri; and Gut, Vladimir, to Ceskoslovenska akademie ved. Polymeric carrier for a controlled synthesis of peptides and the method of its preparation. 4,133,942, Cl. 521-147.000.
Cowles, Christopher S., to Shell Oil Company. Combination geophone-hydrophone. 4,134,097, Cl. 340-7.00R.
Cragoe, Edward J., Jr.: *See—*
Bolhofer, William A.; Cragoe, Edward J., Jr.; and Hoffman, Jacob M., Jr., 4,133,885, Cl. 424-256.000.
Cram, Phillip J.; and Pachovsky, Roman A., to Texaco Canada Inc. Recovery of petroleum from viscous petroleum-containing formations including tar sands. 4,133,382, Cl. 166-263.000.
Cravens, Harold E. Cartonized tray. 4,133,430, Cl. 206-497.000.
Cray, Daniel G., to British Petroleum Company Limited, The. Apparatus for testing lubricants. 4,133,200, Cl. 73-10.000.
CRC Compagnia Ricerca Chimca, S.A.: *See—*
Zamoia, Branimir; and Kajfez, Franjo, 4,133,716, Cl. 195-96.000.
Crest Industries, Inc.: *See—*
Rasmussen, Harry R.; Kimzey, Gene A.; and Hailey, Robert D., 4,133,985, Cl. 179-99.000.
Cromwell, Kenneth C. Bivalve opener. 4,133,078, Cl. 17-75.000.
Crowe, John J.; Kun, Leslie C.; and Nies, George E., to Union Carbide Corporation. Direct machining method of manufacture of isostress contoured dies. 4,133,227, Cl. 76-107.00R.
Crump, John M., Jr. Soiled diaper wringer device. 4,133,056, Cl. 4-1.000.
Crumrine, John C.: *See—*
Richardson, Raymond W.; Burda, Robert E.; and Crumrine, John C., 4,133,391, Cl. 172-311.000.
Cullen, Robert E.: *See—*
Herzer, William P.; and Cullen, Robert E., 4,133,275, Cl. 112-121.120.
Cummins Engine Company, Inc.: *See—*
Glasson, Richard E.; and Lauterbach, Jerre F., 4,133,417, Cl. 192-58.00B.
Cunningham, Charles R. System for measuring the reflectance or emittance of an arbitrarily curved surface. 4,134,015, Cl. 250-341.000.
Curb, Walter R., to Chamberlain Manufacturing Corporation. Extensible boom. 4,133,411, Cl. 182-2.000.
Curtiss, George R., to Cooper Industries, Inc. Motor mounting device. 4,134,036, Cl. 310-42.000.
Cutler-Hammer, Inc.: *See—*
Gentzler, Charles R., 4,134,080, Cl. 330-307.000.
CVI Corporation: *See—*
Hoy, David R.; Hickey, Thomas N.; Spulgis, Ivars S.; and Parish, Harold C., 4,133,651, Cl. 55-75.000.
Dahm, Jan. Method of retrieving articles from storage and an apparatus for carrying out the method. 4,133,436, Cl. 214-16.40A.
Daikin Kogyo Co., Ltd.: *See—*
Nakano, Juichi, 4,133,632, Cl. 431-328.000.
Daimler-Benz Aktiengesellschaft: *See—*
Reidelbach, Willi; Renner, Hermann; and Klie, Wolfgang, 4,133,549, Cl. 280-784.000.
Dana Corporation: *See—*
Sarson, Charles R.; and Browne, Frederick S., 4,133,564, Cl. 285-321.000.
Danchenko, Mikhail E.: *See—*
Esibyan, Eduard M.; Danchenko, Mikhail E.; Malkin, Vasily B.; Dotsenko, Vsevolod D.; and Asoyants, Grigory B., 4,133,988, Cl. 219-121.00P.
Dardai, Pal; Meckl, Ferenc; Papp, Jozsef; and Varga, Elemer, to Banyaszati Kutato Intezet. Magnetohydrodynamic power systems. 4,134,034, Cl. 310-11.000.
Darlington, William B.: *See—*
Du Bois, Donald W.; and Darlington, William B., 4,133,730, Cl. 204-98.000.
Datotek, Inc.: *See—*
Branscome, Kenneth M.; Morgan, Barrie O.; and Carter, Merlon B., 4,133,973, Cl. 178-22.000.
Morgan, Barrie O., 4,133,974, Cl. 178-22.000.
Dauser, William C., Jr. Electrical connector. 4,133,596, Cl. 339-98.000.
Davies, David P., to McGraw-Edison Company. Connector device for electrically and hydraulically connecting a water-cooled conductor. 4,133,559, Cl. 285-41.000.
Davis, H. R.; Long, R. H.; and Simone, A. A., to Lummus Company, The. Gravity settling. 4,133,758, Cl. 210-83.000.
Davy, Jerry D. Fishing rod storage and support apparatus. 4,133,131, Cl. 43-21.200.
Dawson, Thomas J., to United States of America, Navy. Coated electrodes for underwater metal working. 4,133,935, Cl. 428-379.000.
De Cardenas S.p.A.: *See—*
De Cardenas, Roberto R., 4,133,655, Cl. 55-223.000.
Debaigt, Jean, to CGEE Alsthom. Support rail for terminal blocks. 4,133,597, Cl. 339-125.00R.
De Cardenas, Roberto R., to De Cardenas S.p.A. Scrubber for blast furnace gas. 4,133,655, Cl. 55-223.000.
De Cola, Charles R. Rotary abrasive tool. 4,133,146, Cl. 51-336.000.
de Corlieu, Guy; Malard, Marcel; Reymond, Jean-Claude; and Robin, Leon, to Thomson-CSF. Light retro-reflecting responser and data modulator arrangement. 4,134,008, Cl. 250-199.000.
Deegan, Claude C.: *See—*
Sahajpal, Ved K.; Sarver, Larry D.; and Deegan, Claude C., 4,133,788, Cl. 260-29.7UP.
Deere & Company: *See—*
Hubbard, Arthur L., 4,133,166, Cl. 56-44.000.
Love, Mahlon L., 4,133,225, Cl. 74-750.00R.
Deffner, John F., to Gulf Research & Development Company. Organic synergists for organo-cerium (IV) anti-knock additives in lead-free fuel compositions. 4,133,648, Cl. 44-68.000.
Degois, Michel: *See—*
Bellocci, Rio; and Degois, Michel, 4,133,370, Cl. 164-309.000.
Deigner, Paul: *See—*
Koester, Eberhard; Deigner, Paul; Falk, Roland; Uhl, Karl; Schaefer, Dieter; Mayer, Dieter; Motz, Herbert; and Felleisen, Peter, 4,133,911, Cl. 427-130.000.
DeKalb Ag Research, Inc.: *See—*
Poage, Roy L.; and Jewell, Michael A., 4,133,476, Cl. 235-85.0FC.
de Lallee, Jacques; Marie, Gerard; and Moracchioli, Robert, to Commissariat a l'Energie Atomique. Thin-film heat exchanger. 4,133,377, Cl. 165-118.000.
del Castillo, Juan M. Device to identify chords on a keyboard instrument and key mechanism for use therewith. 4,133,989, Cl. 200-5.00E.
della Porta, Paolo; and Rabusin, Elio, to S.A.E.S. Getters S.p.A. Getter comprising U-shaped channel ring having two ring holders containing getter material. 4,134,041, Cl. 313-481.000.
Delle-Alsthom S.A: *See—*
Rozier, Paul; and Granson, Jean, 4,133,994, Cl. 200-307.000.
DeLoach, Thomas R.; and Kusek, Walter W., to Coastal Engineered Products Company, Inc. Whip antenna formed of electrically conductive graphite strands embedded in a resin material. 4,134,120, Cl. 343-715.000.
DeLuca, Albert M.: *See—*
Costello, Matthew J.; Saunders, Thomas K.; and DeLuca, Albert M., 4,134,136, Cl. 358-291.000.
Demag, A.G.: *See—*
Schubert, Hans-Joachim; Schunk, Eckart; and Rossbach, Horst, 4,134,148, Cl. 361-334.000.
DeMoss, Dean L.: *See—*
Ragle, Herbert U.; and DeMoss, Dean L., 4,134,143, Cl. 360-98.000.
Ragle, Herbert U.; and DeMoss, Dean L., 4,134,144, Cl. 360-133.000.
Den Blaker, William E. Goblet-type receptacle holder. 4,133,432, Cl. 211-71.000.
Denebeim, Julian B. Vaginal barrier for animals. 4,133,297, Cl. 119-143.000.

Denes, Oscar L., to Allen-Bradley Company. Trimmable resistor. 4,134,096, Cl. 338-195.000.

DePooter, Clarence E. Pull tab opener. 4,133,228, Cl. 81-3.10R.

Derichs, Josef; and Koslowski, Gerhard, to W. Schlafhorst & Co. Closed pneumatic load-applying device for thread brakes. 4,133,492, Cl. 242-150.00R.

Dermy, Rene M.: *See—*
Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., 4,133,180, Cl. 405-170.000.

DeRossi, John F.: *See—*
Sekmakas, Kazys; Shah, Raj; and DeRossi, John F., 4,133,790, Cl. 260-29.6NR.

DeSaw, Fred A., to Cooper Industries, Inc. Furnishing weld material. 4,133,469, Cl. 228-7.000.

DeSoto, Inc.: *See—*
Sekmakas, Kazys; Shah, Raj; and DeRossi, John F., 4,133,790, Cl. 260-29.6NR.

Deurloo, Johannis M., to Draka Kabel B.V. Electric cord winder. 4,133,416, Cl. 191-12.20R.

Devices Development Corporation: *See—*
Berard, Louis N.; Hollmann, Alfred G.; and Stein, Leonard A., 4,133,140, Cl. 49-49.000.

Devine, Billy B.; and Robertson, Otis E. Ground slope analyzer. 4,133,116, Cl. 33-386.000.

Dey, Noel D.: *See—*
Bolton, Ellis T.; and Dey, Noel D., 4,133,294, Cl. 119-4.000.

Diana, Guy D.: *See—*
Collins, Joseph C.; and Diana, Guy D., 4,133,959, Cl. 560-53.000.

Dickey, Robert B., to PACCAR Inc. Automatic air circulation control. 4,133,185, Cl. 62-179.000.

Didier Engineering GmbH: *See—*
Lehner, Karl, 4,133,620, Cl. 425-72.00S.
Wagener, Dietrich, 4,133,719, Cl. 201-40.000.

Diesinger, Walter; and Homburg, Axel, to Dynamit Nobel AG. Training projectile. 4,133,265, Cl. 102-92.700.

Dillingham, Julia E. Bag filling kit. 4,133,356, Cl. 141-316.000.

DiMarzio, Lawrence P. Electric pickup. 4,133,243, Cl. 84-1.150.

DiNicolantonio, Arthur R.; and Theysen, Humphrey R., to Exxon Research & Engineering Co. Hinged pressure relief tray. 4,133,852, Cl. 261-114.0TC.

Dippold, Walter J., to International Telephone & Telegraph Corp. Magnetic focused microchannel plate image intensifier having dynamic range enhancement. 4,134,009, Cl. 250-205.000.

Dittner, Adam: *See—*
Hartmann, Georg; Dittner, Adam; and Prenzel, Karl, 4,133,511, Cl. 251-133.000.

Djordjevich, Ljubomir: *See—*
Miller, Irving F.; and Djordjevich, Ljubomir, 4,133,874, Cl. 424-38.000.

Dobler, Karl-Ulrich; and Spannagel, Richard, to International Standard Electric Corporation. System for protected data transmission to track-bound vehicles. 4,133,504, Cl. 246-5.000.

Dr. C. Otto & Comp. G.m.b.H.: *See—*
Franzer, Wolfgang; and Adamus, Hans J., 4,133,720, Cl. 202-223.000.

Donahoo, Joe T., to General Electric Company. Fractional horsepower motors with selectable winding windows. 4,134,035, Cl. 310-42.000.

Dong Hwa Titanium Industrial Co.: *See—*
Yoshio, Kosaki; Katsumi, Yagi; and Yasuo, Kura, 4,133,864, Cl. 423-85.000.

Donkers, Jacobus M., to N.V. Industrieele Handelscombinatie Holland. Dredging apparatus with spring-supported bucket ladder. 4,133,120, Cl. 37-69.000.

Dooley, Richard A. Remote controller. 4,133,222, Cl. 74-501.00R.

Dopson, Gaylord W., to Magma Copper Company. System and method of controlling froth flotation. 4,133,746, Cl. 209-1.000.

Doria, Gianfederico: *See—*
Gandolfi, Carmelo; Doria, Gianfederico; and Gaio, Pietro, 4,133,829, Cl. 562-503.000.

Dorst-Keramikmaschinen-Bau Otto Dorst und Dipl.-Ing. Walter Schlegel: *See—*
Schubart, Rolf E. R., 4,133,626, Cl. 425-405.00H.

Dotsenko, Vsevolod D.: *See—*
Esibyan, Eduard M.; Danchenko, Mikhail E.; Malkin, Vasily B.; Dotsenko, Vsevolod D.; and Asoyants, Grigory B., 4,133,988, Cl. 219-121.00P.

Dow Chemical Company, The: *See—*
Markley, Lowell D., 4,133,837, Cl. 260-651.00R.
Simmons, Bobby G., 4,133,773, Cl. 252-359.00E.
Wagner, Eugene R.; Renzi, Alfred A.; and Allen, Bobbie J., 4,133,890, Cl. 424-282.000.

Dow Corning Corporation: *See—*
Bokerman, Gary N.; and Gordon, David J., 4,133,939, Cl. 428-447.000.

Dow, Robert E. Ribbon slitter. 4,133,109, Cl. 30-279.00R.

Dowd, Daniel J., to Westvaco Corporation. Stretchable material rewinding machine. 4,133,495, Cl. 242-66.000.

Dowling, Edward C.: *See—*
Cobaugh, Robert F.; Dowling, Edward C.; and Taylor, Attalee S., 4,133,592, Cl. 339-17.00M.

Downs, Thomas C., to General Motors Corporation. Reservoir with integrally formed window and method of making same. 4,133,287, Cl. 116-227.000.

Doyle, Natividad F. Game device. 4,133,533, Cl. 273-106.00A.

Draeger, William H.: *See—*
McGuire, Hubert E.; and Draeger, William H., 4,133,977, Cl. 179-1.50M.

Draka Kabel B.V.: *See—*
Deurloo, Johannis M., 4,133,416, Cl. 191-12.20R.

Dravo Corporation: *See—*
Jaquay, Louis H., 4,133,718, Cl. 201-6.000.

Dressell, Richard G., Jr.; and Heideman, Robert J. Linear force shock absorber. 4,133,415, Cl. 188-285.000.

Driscoll, Michael M.; and Arakelian, Rafi. Narrow deviation voltage controlled crystal oscillator for mobile radio. 4,134,085, Cl. 331-116.00R.

Droux, Jacques P.: *See—*
Cardot, Claude R.; Droux, Jacques P.; and Oisel, Andre J., 4,134,138, Cl. 360-39.000.

Dual Gebruder Steidinger: *See—*
Laufer, Helmut, 4,133,498, Cl. 242-201.000.

Dube, George, to Owens-Illinois, Inc. Hybrid laser structures. 4,134,084, Cl. 331-94.50F.

Du Bois, Donald W.; and Darlington, William B., to PPG Industries, Inc. Electrolysis of brine using titanium alloy electrode. 4,133,730, Cl. 204-98.000.

Ducasse, Joseph C. V.; and Bouvet, Jean, to Unice Machine Company. Vertical heat exchanger. 4,133,375, Cl. 165-92.000.

Dulux Australia Ltd.: *See—*
Henshaw, Bruce C.; and Lubbock, Frederick J., 4,133,785, Cl. 260-22.0CB.

Dunn, George L.; and Hoover, John R. E., to SmithKline Corporation. 7-Hydroxyhalophenylacetamido-3-heterocyclicthiomethyl cephalosporins. 4,133,882, Cl. 424-246.000.

Du Pont de Nemours, E. I., and Company: *See—*
Cope, Steven A., 4,133,728, Cl. 204-68.000.
Taylor, Jack D., 4,133,844, Cl. 260-857.00L.

Durand, Pierre, to Compagnie Generale des Etablissements Michelin. Electrochemical generators having two sedimentation-bed chambers fed in series with an electrolyte which contains particles. 4,133,940, Cl. 429-12.000.

Durant, Graham J.; and Ganellin, Charon R., to Smith Kline & French Laboratories Limited. Guanidino, thioureido, isothioureido and nitrovinylamino derivatives of pyridine. 4,133,886, Cl. 424-263.000.

Dynamic Controls Limited: *See—*
Burgess, Colin H., 4,133,288, Cl. 116-277.000.

Dynamit Nobel AG: *See—*
Diesinger, Walter; and Homburg, Axel, 4,133,265, Cl. 102-92.700.

Dzus Fastener Co., Inc.: *See—*
Dzus, Theodore, Jr., 4,133,142, Cl. 49-379.000.

Dzus, Theodore, Jr., to Dzus Fastener Co., Inc. Latch. 4,133,142, Cl. 49-379.000.

E. R. Squibb & Sons, Inc.: *See—*
Varma, Ravi K., 4,133,811, Cl. 260-239.55R.
Vogt, B. Richard, 4,133,809, Cl. 260-239.30T.

Early, William E.; and Linn, Michael G., to United States of America, Navy. Abrasive disc of polyurethane bonded metallic wool. 4,133,144, Cl. 51-294.000.

Earnest, Ernest R.; and Passinos, Bill, to Hydragon Corporation. Temperature stratified turbine compressors. 4,133,171, Cl. 60-39.18B.

Earsley, Melvin L., to Industrial Molding Corporation. Ball separator for ball bearing. 4,133,588, Cl. 308-201.000.

Eastman Kodak Company: *See—*
Brewer, Richard J.; Grant, Peter M.; and Taylor, Robert B., 4,133,783, Cl. 260-15.000.
Chen, Tsang J.; and McLaen, Donald F., 4,133,687, Cl. 96-76.00R.
Holmes, Jerry D., 4,133,963, Cl. 562-519.000.
Watkins, Windell C., 4,133,961, Cl. 560-190.000.

Eastman Technology, Inc.: *See—*
Wright, Charles E.; and Calaway, Ward M., 4,134,140, Cl. 360-67.000.

Ebauches S.A.: *See—*
Portmann, Hubert, 4,134,057, Cl. 320-61.000.
Scherrer, Igor; and Hersberger, Pierre, 4,133,169, Cl. 58-23.00R.

Ebel, Bruno; Krumholz, Gunter; and Rahn, Paul, to Meyer, Roth & Pastor Maschinenfabrik GmbH. Apparatus for the successive welding of consecutive chain links. 4,133,999, Cl. 219-51.000.

Eberhard Hoeckle GmbH, Firma: *See—*
Schuller, Walter, 4,133,190, Cl. 64-23.700.

Eberhardt, Edward H., to International Telephone & Telegraph Corp. Bistable image tube. 4,134,010, Cl. 250-213.0VT.

Eccardt, Curtis J.: *See—*
Groya, George J.; and Eccardt, Curtis J., 4,133,357, Cl. 142-49.000.

Eckstein, Ernest; Helmle, Anton; Perlin, Jordan; and Spitalnik, Irving, to Eckstein, Ernest. Method and apparatus for securing carrying handles to bags. 4,133,252, Cl. 93-35.00H.

Ecodyne Corporation: *See—*
Ovard, John C., 4,133,851, Cl. 261-111.000.

Edagawa, Setsuji: *See—*
Shibazaki, Hiroji; Edagawa, Setsuji; Hasegawa, Hisashi; and Kondo, Satoshi, 4,133,894, Cl. 423-432.000.

Edelstein, Henry R.: *See—*
O'Connell, Timothy R.; Edelstein, Henry R.; and Leach, George S., 4,134,151, Cl. 365-189.000.

Edison, Robert R.: *See—*
Holloway, Richard L.; Edison, Robert R.; and Wachtel, Stephen J., 4,133,644, Cl. 422-138.000.

Efimov, Viktor A.: *See*—
Babaskin, Jury Z.; Efimov, Viktor A.; Sokirko, Leonid A.; Rostovskaya, Leonora A.; Shipitsyn, Sergei Y.; Semenyaka, Georgy D.; and Lutsenko, Georgy G., 4,133,680, Cl. 75-129.000.
Egyesult Izzolampa es Villamossagi Reszvenytarsasag: *See*—
Vida, Denes; Nagel, Ferenc; Oldal, Endre; and Ugrosdy, Laszlo, 4,134,039, Cl. 313-229.000.
Eilenberg, Stanton L.; Feiner, Melvin; Shuford, Charles L.; and Triplett, David W., to Rockwell International Corporation. Advanced cryogenic multi-staged radiator system. 4,133,376, Cl. 165-105.000.
Eisenrith, Karl-Heinz: *See*—
Aulich, Hubert; Grabmaier, Josef; and Eisenrith, Karl-Heinz, 4,133,664, Cl. 65-3.00A.
Ek, Roger B.: *See*—
Rhodes, Jerry D.; and Ek, Roger B., 4,133,666, Cl. 65-101.000.
Electric Power Research Institute, Inc.: *See*—
Farcasiu, Malvina; Mitchell, Thomas O ; and Whitehurst, Darrell Duayne, 4,133,646, Cl. 44-1.00R.
Electricite de France - Service National: *See*—
Berthet, Michel; Gillet, Roger; Marquet, Andre; and Moisson-Franckhauser, Francois, 4,134,037, Cl. 310-52.000.
Electronic Memories & Magnetics Corporation: *See*—
O'Connell, Timothy R.; Edelstein, Henry R.; and Leach, George S., 4,134,151, Cl. 365-189.000.
Eli Lilly and Company: *See*—
Abdulla, Riaz F.; and Terando, Norman H., 4,133,956, Cl. 544-336.000.
Blanchard, William B.; and Ryan, Charles W., 4,133,816, Cl. 260-340.700.
Cooper, Robin D. G.; and Spry, Douglas O., 4,133,808, Cl. 260-239.00A.
Hamill, Robert L.; and Hoehn, Marvin M., 4,133,876, Cl. 424-121.000.
Holmes, Richard E., 4,133,884, Cl. 424-250.000.
Jones, C. David; and Suarez, Tulio, 4,133,814, Cl. 260-326.55A.
Elkem-Spigerverket A/S: *See*—
Krogsrud, Harald, 4,133,657, Cl. 55-290.000.
Ellis, Arthur K.: *See*—
Ellis, Cadwalader H.; and Ellis, Arthur K., 4,133,132, Cl. 43-41.000.
Ellis, Cadwalader H.; and Ellis, Arthur K. Plug-cut herring protector. 4,133,132, Cl. 43-41.000.
Elsenheimer, Gerd: *See*—
Jelinek, Horst; Elsenheimer, Gerd; and Klersy, Bernhard, 4,133,749, Cl. 209-24.000.
Ely, John W., to Halliburton Company. Terminating the flow of fluids from uncontrolled wells. 4,133,383, Cl. 166-270.000.
EMDE Corporation: *See*—
Bailey, Donald L., 4,133,304, Cl. 128-2.00F.
Emerson Electric Co.: *See*—
Groya, George J.; and Eccardt, Curtis J., 4,133,357, Cl. 142-49.000.
Mittendorf, Richard J.; and Morris, Raymond H., 4,133,105, Cl. 30-103.000.
Quin, Murray L., 4,134,045, Cl. 315-324.000.
Energy Systems Corporation: *See*—
Zebuhr, William H., 4,133,055, Cl. 2-411.000.
English, Edward: *See*—
Riley, Victor; Macnab, Ian; Timusk, John; and English, Edward, 4,133,928, Cl. 428-255.000.
Ensanian, Minas. Process for determining properties of materials. 4,133,722, Cl. 204-1.00T.
Envirotech Corporation: *See*—
Moore, Robert T., 4,133,733, Cl. 204-195.00T.
Eppens, Hindrik E. H., to Keramisch Instituut Haarlem, B.V. Method and device for controlling the temperature variation in a potter's oven. 4,134,005, Cl. 219-413.000.
Ernst, Richard R., to Varian Associates, Inc. Selective detection of multiple quantum transitions in nuclear magnetic resonance. 4,134,058, Cl. 324-0.50A.
Ernsthausen, Roger E.: *See*—
Fein, Michael E.; Byrum, Bernard W., Jr.; and Ernsthausen, Roger E., 4,133,934, Cl. 428-336.000.
Esdaile, James D.; and Walters, Graeme W., to Commonwealth Scientific and Industrial Research Organization. Continuous reflux refining of metals. 4,133,517, Cl. 266-200.000.
Esibyan, Eduard M.; Danchenko, Mikhail E.; Malkin, Vasily B.; Dotsenko, Vsevolod D.; and Asoyants, Grigory B. Method of plasma arc cutting control and a device for realizing same. 4,133,988, Cl. 219-121.00P.
Esquire, Inc.: *See*—
Holmes, Kenneth P., 4,134,044, Cl. 315-209.00R.
Nuver, Eric L. H., 4,134,043, Cl. 315-92.000.
Esso Societe Anonyme Francaise: *See*—
Bouvin, Jacques, 4,133,485, Cl. 239-399.000.
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Bouchet, Bernard, 4,133,447, Cl. 220-258.000.
Ethyl Products Company: *See*—
Ostrowsky, Efrem M., 4,133,449, Cl. 220-339.000.
Etudes Petrolieres Marines: *See*—
Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., 4,133,180, Cl. 405-170.000.
Evans, David C.: *See*—
Robinson, Stephen P.; Evans, David C.; and Hewitt, Martin, 4,134,141, Cl. 360-90.000.
Evans, Phillip H., to BSR Limited. Record player switch-off mechanism. 4,133,539, Cl. 274-1.00L.
Evans, Sydney; and Rutherford, Leonard J., to Scientific Apparatus Limited. Mass spectrometers. 4,134,013, Cl. 250-298.000.
ever-clean GmbH H.W. Nixdorf: *See*—
Mader, Elmar, 4,133,575, Cl. 296-95.00R.
Ewig, John F., to Parker Manufacturing Company. Stapler. 4,133,468, Cl. 227-126.000.
Exxon Production Research Company: *See*—
Mifsud, Joseph F.; and Bedenbender, John W., 4,133,409, Cl. 181-114.000.
Exxon Research & Engineering Co.: *See*—
DiNicolantonio, Arthur R.; and Theysen, Humphrey R., 4,133,852, Cl. 261-114.0TC.
Trimble, John O., 4,133,737, Cl. 204-197.000.
F.lli Marzoli & C. S.p.A.: *See*—
Marzoli, Angelo, 4,133,073, Cl. 15-308.000.
Face, Samuel A., Jr. Device for removing water from large floor surfaces. 4,133,072, Cl. 15-353.000.
Falcioni, Joseph G., to Boeing Commercial Airplane Company. Apparatus and method for self-positioning a squeezed rivet. 4,133,096, Cl. 29-522.00A.
Falk, Roland: *See*—
Koester, Eberhard; Deigner, Paul; Falk, Roland; Uhl, Karl; Schaefer, Dieter; Mayer, Dieter; Motz, Herbert; and Felleisen, Peter, 4,133,911, Cl. 427-130.000.
Fancy, Richard E., to General Motors Corporation. Seat back adjusting mechanism. 4,133,578, Cl. 297-370.000.
Fanella, Michael. Hair spray assembly. 4,133,486, Cl. 239-499.000.
Farcasiu, Malvina; Mitchell, Thomas O.; and Whitehurst, Darrell Duayne, to Electric Power Research Institute, Inc. Phenolic recycle solvent in two-stage coal liquefaction process. 4,133,646, Cl. 44-1.00R.
Farkas, Daniel F.: *See*—
Carlson, Robert A.; Roberts, Robert L.; and Farkas, Daniel F., 4,133,898, Cl. 426-462.000.
Farkas, Laszlo. Travel drive for a drawing engine of a one-rail track suspension railroad in mines. 4,133,267, Cl. 105-29.00R.
Farmland Industries, Inc.: *See*—
Byrd, Michael D.; and Scott, August R., 4,133,670, Cl. 71-34.000.
Federal-Mogul Corporation: *See*—
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Fehler, Adolf; Kappler, Gunter; Kirschey, Gunter; and Schmidt, Jost, to Motoren-und Turbinen-Union Munchen GmbH. Combustion chamber for gas turbine engines. 4,133,633, Cl. 431-352.000.
Fein, Michael E.; Byrum, Bernard W., Jr.; and Ernsthausen, Roger E., to Owens-Illinois, Inc. Article comprising dielectric body. 4,133,934, Cl. 428-336.000.
Feiner, Melvin: *See*—
Eilenberg, Stanton L.; Feiner, Melvin; Shuford, Charles L.; and Triplett, David W., 4,133,376, Cl. 165-105.000.
Feldman, Keiva, to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence in Her Majesty's Canadian Government. Battery deterioration monitoring apparatus employing voltage comparison means for activation of a battery alarm. 4,134,060, Cl. 324-29.500.
Felleisen, Peter: *See*—
Koester, Eberhard; Deigner, Paul; Falk, Roland; Uhl, Karl; Schaefer, Dieter; Mayer, Dieter; Motz, Herbert; and Felleisen, Peter, 4,133,911, Cl. 427-130.000.
Fellnor, John R.; and Love, William J., Jr., to Combustion Engineering, Inc.,. Method and apparatus for drying and preheating small metallic particles. 4,133,635, Cl. 432-19.000.
Felten & Guilleaume Carlswerk AG: *See*—
Braun, Dieter, 4,133,622, Cl. 425-129.00R.
Ferguson Industries, Inc.: *See*—
Lanier, Juan E., 4,133,487, Cl. 241-5.000.
Fermi, Rudy; Pickard, John; Kocsis, Alex; Bratton, David; and Kasner, Gerald, to K & F Manufacturing Co., Inc. Clamping assembly for thin printing plates. 4,133,264, Cl. 101-415.100.
Fernholz, Hans; Schmidt, Hans-Joachim; Wunder, Friedrich; and Roscher, Gunter, to Hoechst Aktiengeselischaft. Process for the preparation of carboxylic acid alkenyl esters. 4,133,962, Cl. 560-245.000.
Fernsler, Ronald E., to RCA Corporation. Ramp generator for harmonic tuned deflection. 4,134,082, Cl. 331-20.000.
Ferranti Limited: *See*—
Kane, Jeffrey, 4,134,124, Cl. 357-48.000.
Ferre, Franco: *See*—
Stigliani, Giuseppe; Giudici, Alessandro; and Ferre, Franco, 4,133,945, Cl. 526-189.000.
Fetzer, Richard W.; and Ramachandran, Kolar S., to Quaker Oats Company, The. Protein film process. 4,133,901, Cl. 426-573.000.
Feuerman, Arnold I. Vaporized fuel for internal combustion engine and method and apparatus for producing same. 4,133,847, Cl. 261-18.00A.
Filipovich, Danny, to Bell & Howell Company. Tri-directional positioning device for optical system including locking means. 4,134,129, Cl. 358-55.000.
Fillios, Frank T. Expandable camper body. 4,133,571, Cl. 296-23.00C.
Filter Specialists, Inc.: *See*—
Morgan, Howard W., Jr., 4,133,769, Cl. 210-455.000.
Filterlab Corporation a subsidiary of Masco Corporation: *See*—
Soltis, Charles W., 4,133,653, Cl. 55-126.000.
Fischer, Charles F., to Colgate-Palmolive Company. Packaging of tablets. 4,133,431, Cl. 206-532.000.

Fisher, C. Donald: *See—*
Schaffer, Harry E., Jr.; and Fisher, C. Donald, 4,133,748, Cl. 209-17.000.
Fisher, Eugene L.: *See—*
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Fisher, Jack M.: *See—*
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Fisons, Ltd.: *See—*
Augstein, Joachim; Carter, David; and Lee, Thomas B., 4,133,889, Cl. 424-269.000.
Fitton, Robert C.: *See—*
Bertorelli, Orlando L.; and Fitton, Robert C., 4,133,694, Cl. 106-288.00B.
Fives-Cail Babcock: *See—*
Mercier, Andre, 4,133,770, Cl. 210-497.0FB.
Flanyak, John R.; and Norton, Herbie R., to Miles Laboratories, Inc. Preparation of juicy, self-basting sausage-like food products. 4,133,897, Cl. 426-250.000.
Fletcher, Ronald B.: *See—*
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Fleury, Guy J.: *See—*
Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., 4,133,180, Cl. 405-170.000.
Flexicore Co., Inc., The: *See—*
Wise, Mark J., 4,133,619, Cl. 425-64.000.
Floss Aid Corporation: *See—*
Naslund, Erik I., 4,133,339, Cl. 132-89.000.
Flynn, Charles S., to Blu-Surf, Inc. Tentor. 4,133,636, Cl. 432-72.000.
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Forsyth Dental Infirmary for Children: *See—*
Hillman, Jeffrey D., 4,133,875, Cl. 424-93.000.
Forward, John E., to Xerox Corporation. Deformable toner dispenser with flow rate controller. 4,133,459, Cl. 222-314.000.
Foster Wheeler Energy Corporation: *See—*
Beckman, Eugene B., 4,133,659, Cl. 55-314.000.
Steiner, Peter, 4,133,660, Cl. 55-387.000.
Fox, Anthony E., to Massey-Ferguson Inc. Engine componentry. 4,133,547, Cl. 180-54.00A.
FPD Corporation: *See—*
Mackniesh, Frank, 4,133,467, Cl. 224-52.000.
Franzer, Wolfgang; and Adamus, Hans J., to Dr. C. Otto & Comp. G.m.b.H. Support apparatus for a battery of underjet coke ovens. 4,133,720, Cl. 202-223.000.
Frayer, James A.; Lese, Henri K.; McKinney, Joel D.; Metzger, Kirk J.; and Paraskos, John A., to Gulf Research & Development Company. Hydrodesulfurization catalyst. 4,133,777, Cl. 252-465.000.
Fread, Ronald G. Microwave oven egg cooking apparatus. 4,133,996, Cl. 219-10.55M.
Freeman, Roger A.: *See—*
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Freese, Gary P., to Caterpillar Tractor Co. Cushion link and hydraulic stabilizer for bulldozer blade. 4,133,392, Cl. 172-809.000.
French, Gordon B., to Occidental Oil Shale. Isolation of in situ oil shale retorts. 4,133,580, Cl. 299-2.000.
Frieseke & Hoepfner GmbH: *See—*
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Frolov, Jury F. Apparatus for forming self-sintering electrodes. 4,133,968, Cl. 13-18.00R.
Fuel, Inc.: *See—*
Mikel, Merle E., 4,133,671, Cl. 71-54.000.
Fuger, Karl E.; and Sheng, Ming N., to Atlantic Richfield Company. Cyclic nitrile carbonate-containing compounds. 4,133,813, Cl. 260-307.00A.
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Yamazaki, Tuneo; Shiino, Kaoru; Yamaguchi, Akira; and Kato, Toshihiro, 4,133,491, Cl. 242-56.900.
Fujikura, Yoshiaki: *See—*
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Fujitsu Fanuc Limited: *See—*
Inaba, Seiuemon; Shimajiri, Tokiji; and Oyama, Shigeaki, 4,133,230, Cl. 82-28.00R.
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Fukui, Katsuo; and Inoue, Tomio, to Sanyo Electric Co., Ltd. Apparatus for charging rechargeable battery. 4,134,056, Cl. 320-20.000.
Fukushima, Kiyoshi: *See—*
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Takatori, Osho; Nishikawa, Etsuo; and Fukuyama, Yosinobu, 4,133,280, Cl. 112-262.000.
Fulbright, Burley R., Jr. Lifting apparatus for toilet seat. 4,133,062, Cl. 4-251.000.
Fuller, Robert B. Eyeglass retainer. 4,133,604, Cl. 351-123.000.
Funke, Maurice F., to United States of America, Army. Fluidic mud pulse data transmission apparatus. 4,134,100, Cl. 340-18.0LD.
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Fuzimura, Susumu: *See—*
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Gaidis, James M.: *See—*
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Gaio, Pietro: *See—*
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Galvin, Aaron A., to American District Telegraph Company. Transceiver with skewed transducers for low close-in sensitivity. 4,134,110, Cl. 340-552.000.
Gambino, Joseph. Golf grip. 4,133,529, Cl. 273-81.00R.
Gandolfi, Carmelo; Doria, Gianfederico; and Gaio, Pietro, to Carlo Erba S.p.A. 8,12-Diisoprostanoic acid derivatives. 4,133,829, Cl. 562-503.000.
Ganellin, Charon R.: *See—*
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Gano, John C., to Otis Engineering Corporation. Well tubing head. 4,133,378, Cl. 166-85.000.
Gardner, Derek V., to Beecham Group Limited. Polycyclic chromenes useful as antidepressants and anorexics. 4,133,883, Cl. 424-248.520.
Gardner, Larry D. Device for mounting/demounting tires on custom automobile wheels. 4,133,363, Cl. 157-1.300.
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Gates, F. Alan, to Helper Industries, Inc. Wheel chair lift apparatus. 4,133,437, Cl. 214-75.00R.
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Collins, Edward J.; and Sterling, Vaughn C., 4,133,631, Cl. 431-359.000.
Donahoo, Joe T., 4,134,035, Cl. 310-42.000.
Hewlett, Clarence W., Jr., 4,133,978, Cl. 179-15.0BS.
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Judd, Edwin B., 4,133,993, Cl. 200-153.00K.
Lavigne, Raymond G.; and Walmet, Gunnar E., 4,134,092, Cl. 337-298.000.
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Vostovich, Joseph E., 4,133,936, Cl. 428-389.000.
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Biskup, Edward J., 4,133,551, Cl. 280-221.000.
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Brucken, Byron L.; and Hodits, Frank W., Jr., 4,133,186, Cl. 62-228.000.
Carroll, Luther E., 4,133,343, Cl. 137-116.500.
Cartwright, John N., 4,133,188, Cl. 64-13.000.
Cataldo, Roy S., 4,133,172, Cl. 60-39.630.
Downs, Thomas C., 4,133,287, Cl. 116-227.000.
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King, Jack B., 4,133,328, Cl. 123-136.000.
MacIver, Bernard A.; and Greenstein, Eugene, 4,133,704, Cl. 148-1.500.
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Small, Robert C., 4,133,246, Cl. 85-80.000.
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Gentile, Patrick J.; and Gentile, Joseph P., to Vamco Machine & Tool, Inc. Gear support assembly. 4,133,216, Cl. 74-384.000.
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Gerber, Heinz J., 4,133,235, Cl. 83-74.000.
Pearl, David R., 4,133,233, Cl. 83-56.000.
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Gerber, Heinz J., to Gerber Garment Technology, Inc. Method and apparatus for cutting sheet material with improved accuracy. 4,133,234, Cl. 83-56.000.
Gerber, Heinz J., to Gerber Garment Technology, Inc. Closed loop apparatus for cutting sheet material. 4,133,235, Cl. 83-74.000.
Gerber Scientific Inc.: *See—*
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Germerdonk, Rolf; and Jonas, Adam, to Bayer Aktiengesellschaft. Removing sulfur dioxide from exhaust air. 4,133,650, Cl. 55-49.000.
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Masi, Paolo; Suarato, Antonino; Giardino, Pietro; Bernardi, Luigi; and Arcamone, Federico, 4,133,877, Cl. 424-180.000.
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Girard, William T.; Richardson, Warner G.; and Wilson, Eugene M., to Caterpillar Tractor Co. Carriage assembly for an elevating scraper dump linkage and method of installing. 4,133,122, Cl. 37-126.0AE.
Giudici, Alessandro: *See—*
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Glasson, Richard E.; and Lauterbach, Jerre F., to Cummins Engine Company, Inc. Fluid drive coupling. 4,133,417, Cl. 192-58.00B.
Glennon, Thomas J., to International Mechanical Contractors, Inc. System for the disposal of sludge, hazardous and other wastes. 4,133,273, Cl. 110-346.000.
Glinski, Paul A., to General Motors Corporation. Seat belt positioning device. 4,133,556, Cl. 280-744.000.
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Glover, Douglas W., to AMP Incorporated. Method of fabricating a laminated bus bar. 4,133,101, Cl. 29-628.000.
Gloyer, Wolfgang. Surrounding carton for transporting containers. 4,133,428, Cl. 206-427.000.
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Gnad, Gerhard, to BASF Aktiengesellschaft. Azo dyes with an N-substituted 2-hydroxy-3-cyano-4-methyl pyrridone-6-coupling component. 4,133,806, Cl. 260-156.000.
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Gordon, Willard F. Navigational wind effect computer for aircraft. 4,134,006, Cl. 235-61.0NV.
Gough, Stanley T. D., to Mobil Oil Corporation. Stabilized organothiophosphorus formulations. 4,133,878, Cl. 424-225.000.
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Granryd, Thorvald G. Convenience anti-wheel spin device for rubber tired vehicles including a winching accessory. 4,133,480, Cl. 238-14.000.
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Green, Harold A.: *See—*
Kaplan, Saul; Merianos, John J.; Green, Harold A.; and Petrocci, Alfonso N., 4,133,772, Cl. 252-106.000.
Greenstein, Eugene; and MacIver, Bernard A., to General Motors Corporation. Selective enhancement of phosphorus diffusion by implanting halogen ions. 4,133,701, Cl. 148-1.500.
Greenstein, Eugene: *See—*
MacIver, Bernard A.; and Greenstein, Eugene, 4,133,704, Cl. 148-1.500.
Greenwald, Harry; and Iglio, Salvatore, to Walter Kidde & Company, Inc. Money box support arrangement. 4,133,419, Cl. 194-1.00B.
Gremion, Robert: *See—*
Maire, Jacques; and Gremion, Robert, 4,133,369, Cl. 164-46.000.
Grenci, Carl A. Impacting apparatus. 4,133,229, Cl. 81-52.300.
Griffin, Hugh A., to Agile Systems, Inc. Automatic lawn mower. 4,133,404, Cl. 180-79.100.
Grigorenko, Georgy M.: *See—*
Lakomsky, Viktor I.; Grigorenko, Georgy M.; Torkhov, Gennady F.; Melnik, Gary A.; and Nesmikh, Vitaly S., 4,133,987, Cl. 219-121.00P.
Grinder, Bryant: *See—*
Halvorsen, James V., 4,133,544, Cl. 279-1.00D.
Gross, Ronald; and Whitfill, Jimmy L. Water pipe. 4,133,318, Cl. 131-173.000.
Grossman, Leonard N.: *See—*
Jacobs, Israel S.; Lahut, Joseph A.; and Grossman, Leonard N., 4,134,064, Cl. 324-201.000.
Groya, George J.; and Eccardt, Curtis J., to Emerson Electric Co. Hand tool rest for forming curved surfaces. 4,133,357, Cl. 142-49.000.
Grumman Aerospace Corporation: *See—*
August, Arthur; and Huber, John G., 4,133,711, Cl. 156-353.000.
Grundler, Ewald: *See—*
Orth, Gunther; Pietsch, Rudolf; and Grundler, Ewald, 4,133,274, Cl. 111-2.000.
GTE Automatic Electric Laboratories Incorporated: *See—*
Lee, David Q.; and Rovnyak, Richard M., 4,133,982, Cl. 179-18.0AH.
GTE Sylvania Incorporated: *See—*
Sasnett, Michael W.; and Whitaker, Angus H., 4,134,083, Cl. 331-94.50G.
Gudgel, Howard S. Pipe current detector with plural magnetic flux detectors. 4,134,061, Cl. 324-54.000.
Guice, John J. Paint spray booth and method of painting an article therein. 4,133,255, Cl. 98-115.0SB.
Guillaumin, Jean C., to Societe des Acieries de Paris et d'Outreau. Railway bogie-trucks and method of manufacturing same. 4,133,268, Cl. 105-202.000.
Gulf Oil Corporation: *See—*
Antonoplos, Patricia A.; and Heilman, William J., 4,133,792, Cl. 260-30.200.
Clinton, Russell M.; Taylor, A. Allilee; and Brown, Jimmy W., 4,133,640, Cl. 23-230.0PC.
Lakshmanan, Pallavoor R., 4,133,789, Cl. 260-27.0EV.
Gulf Research & Development Company: *See—*
Deffner, John F., 4,133,648, Cl. 44-68.000.
Frayer, James A.; Lese, Henri K.; McKinney, Joel D.; Metzger, Kirk J.; and Paraskos, John A., 4,133,777, Cl. 252-465.000.
Paraskos, John A.; and Smith, Edward W., 4,133,740, Cl. 208-8.000.

Pretzer, Wayne R.; Kobylinski, Thaddeus P.; and Bozik, John E., 4,133,966, Cl. 568-902.000.
Gullifiber AB: *See*—
Lundin, Tord R., 4,133,053, Cl. 2-209.000.
Gundal, Peter H., to Packaging Industries, Inc. Shut height adjustment mechanism. 4,133,260, Cl. 100-257.000.
Gurvich, Yury M.: *See*—
Smallbone, Allan H.; and Gurvich, Yury M., 4,134,012, Cl. 250-272.000.
Gut, Vladimir: *See*—
Coupek, Jiri; and Gut, Vladimir, 4,133,942, Cl. 521-147.000.
Gutierrez, Eddie N.; and Lamberti, Vincent, to Lever Brothers Company. Novel ester derivatives of ether polycarboxylic acids and process for making same. 4,133,960, Cl. 560-171.000.
H. H. Robertson Company: *See*—
Ting, Raymond M. L., 4,133,158, Cl. 52-478.000.
Haas, Peter: *See*—
Blahak, Johannes; Wagner, Kuno; Mazanek, Jan; and Haas, Peter, 4,133,943, Cl. 521-163.000.
Haas, Werner E. L.; Mechlowitz, Bela; and Adams, James E., to Xerox Corporation. Agglomeration imaging method. 4,133,683, Cl. 96-1.0PS.
Haase, Jaroslav: *See*—
Bowes, Quentin; Haase, Jaroslav; and Wurster, Rudolf F., 4,133,929, Cl. 428-260.000.
Hachiboshi, Makoto; Matsunami, Koichi; Nagano, Hikoichi; Ieki, Hiroshi; and Oko, Tsutomu, to Toyo Boseki Kabushiki Kaisha. Meta-xylylene diamine/aliphatic dicarboxylic acid polyamide film. 4,133,802, Cl. 528-502.000.
Hadden, Stephen C.: *See*—
Hulls, Leonard R.; and Hadden, Stephen C., 4,133,205, Cl. 73-117.300.
Hage, C. Herbert, to GF Business Equipment, Inc. Partition raceway. 4,133,153, Cl. 52-220.000.
Haggard, Richard A.: *See*—
Lewis, Sheldon N.; and Haggard, Richard A., 4,133,793, Cl. 260-31.20R.
Hagiwara, Yoshiaki, to Sony Corporation. Method of manufacturing a charge transfer device. 4,133,099, Cl. 29-578.000.
Hahn, Ronald E., to Whirlpool Corporation. Dishwater control. 4,134,003, Cl. 219-327.000.
Hailey, Robert D.: *See*—
Rasmussen, Harry R.; Kimzey, Gene A.; and Hailey, Robert D., 4,133,985, Cl. 179-99.000.
Hall, Richard A., to Willamette Industries, Inc. Stacking box construction using glued sides. 4,133,474, Cl. 229-23.00R.
Halliburton Company: *See*—
Ely, John W., 4,133,383, Cl. 166-270.000.
Knox, Lloyd C., 4,133,386, Cl. 166-285.000.
Halm Instrument Co. Inc.: *See*—
Lyon, Floyd A., 4,133,299, Cl. 126-271.000.
Halvorsen, James V., to Grinder, Bryant. Replaceable collet in double diaphragm chuck. 4,133,544, Cl. 279-1.00D.
Hamburger, Jean: *See*—
Bach, Jean-Francois; and Hamburger, Jean, 4,133,804, Cl. 260-112.00R.
Hamill, Robert L.; and Hoehn, Marvin M., to Eli Lilly and Company. Antibiotic A-32887 and process for production thereof. 4,133,876, Cl. 424-121.000.
Hamilton, Alan L.: *See*—
Charlton, John C.; and Hamilton, Alan L., 4,133,951, Cl. 536-25.000.
Hammerblow Corporation, The: *See*—
Pierce, William C., 4,133,553, Cl. 280-509.000.
Hammink, Willem C.; and Verheul, Cornelis A. M., to B. V. Nederlandse Kraanbouw Maatschappij NKM. Hoisting apparatus having improved clamping means. 4,133,570, Cl. 294-110.00R.
Hanley, James O.; and Snyder, Irving F. Coin operated packet dispensing machine. 4,133,421, Cl. 194-57.000.
Hannah, Stephen J.: *See*—
Hartnagel, Hans L.; Hannah, Stephen J.; and Bayraktaroglu, Burhan, 4,133,724, Cl. 204-38.00A.
Hansen, David R.; and St. Clair, David J., to Shell Oil Company. Radiation cured, high temperature adhesive composition. 4,133,731, Cl. 204-159.170.
Hansson, Erik G., to Svenska Kram AB. Connecting clamp. 4,133,085, Cl. 24-263.0SW.
Hara, Mitsunori: *See*—
Ikeda, Hironosuke; Hara, Mitsunori; and Narukawa, Satoshi, 4,133,856, Cl. 264-63.000.
Harned, John L.; and Wolanzyk, Thomas C., to General Motors Corporation. Engine spark timing system with knock retard and wide open throttle advance. 4,133,475, Cl. 123-117.00D.
Harper, Oris E., to Rampon Products, Incorporated. Lower body garment and method. 4,133,054, Cl. 2-407.000.
Harrington, Timothy C.: *See*—
Arthur, Hugh M.; and Harrington, Timothy C., 4,133,454, Cl. 222-56.000.
Harris Corporation: *See*—
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Webster, Lyle B., 4,133,613, Cl. 400-616.300.
Harris, Meade C., Jr.: *See*—
Wolffing, Ralph M.; Batten, Clifford J.; and Harris, Meade C., Jr., 4,133,899, Cl. 426-507.000.
Harris, Robert R.; and Pollack, Warren J., to International Minerals & Chemical Corp. Acrylate-modified alkyd resin. 4,133,786, Cl. 260-22.0CB.
Harrison, George W.; and Moore, Billie G., to Team, Inc. Method and apparatus for sealing a pipeline leak. 4,133,351, Cl. 138-97.000.
Harte, Richard A., to International Diagnostic Technology, Inc. Test article including a covalently attached diagnostic reagent and method. 4,133,639, Cl. 23-230.00B.
Hartman Metal Fabricators, Inc.: *See*—
Gray, Robert B., 4,134,049, Cl. 318-756.000.
Hartmann, Georg; Dittner, Adam; and Prenzel, Karl, to Frieseke & Hoepfner GmbH. Electro-hydraulic regulating valve system. 4,133,511, Cl. 251-133.000.
Hartmannsgruber, Max: *See*—
Kriechbaum, Kurt; Walter, Herbert; Konig, Herbert; and Hartmannsgruber, Max, 4,133,079, Cl. 19-159.00R.
Hartnagel, Hans L.; Hannah, Stephen J.; and Bayraktaroglu, Burhan, to National Research Development Corporation. Anodizing a compound semiconductor. 4,133,724, Cl. 204-38.00A.
Hasegawa, Hisashi: *See*—
Shibazaki, Hiroji; Edagawa, Setsuji; Hasegawa, Hisashi; and Kondo, Satoshi, 4,133,894, Cl. 423-432.000.
Hashimoto, George: *See*—
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Hathaway Instruments, Inc.: *See*—
Bright, James A.; and Clark, Gene H., 4,134,029, Cl. 307-293.000.
Hauser, Hans U., to Bucher-Guyer AG, Maschinenfabrik. Apparatus in a tank for aerating liquids which tend to froth. 4,133,850, Cl. 261-93.000.
Haverhill Meat Products Limited: *See*—
Collins, Paul D., 4,133,075, Cl. 17-26.000.
Hayakawa, Akifumi; Aiba, Akira; Orihara, Eiki; and Fukushima, Kiyoshi, to USM Corporation. Injection foam molding process. 4,133,858, Cl. 264-54.000.
Hayama, Hajime, to Sanyo Electric Co., Ltd. Solar heat collecting apparatus. 4,133,298, Cl. 126-271.000.
Hayashi, Masaki: *See*—
Tarao, Ryohkichi; Kaku, Kanji; Hayashi, Masaki; Nakamura, Takao; Ohishi, Shigeo; and Yamano, Hajime, 4,133,755, Cl. 210-38.00B.
Hayashi, Yoshimasa: *See*—
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Hayashi, Yukihiro: *See*—
Oshimura, Masakazu; Yokoyama, Kenichi; Hayashi, Yukihiro; and Miyake, Akira, 4,133,676, Cl. 75-0.5AA.
Hayes, Douglas R., to United Technologies Corporation. Single crystal casting mold and method for making same. 4,133,368, Cl. 164-35.000.
Hayes, John C., to UOP Inc. Dehydrogenation with a nonacidic multimetallic catalyst. 4,133,839, Cl. 260-666.00A.
Haynes, William L.: *See*—
Bartholomew, Roger F.; Haynes, William L.; and Sanford, Leon M., 4,133,665, Cl. 65-30.00E.
Healey, Dennis R., to Boots Company Limited, The. Method of sterilizing powders in a fluidized bed. 4,133,638, Cl. 422-32.000.
Heavner, Paul W.; and LeMay, William E., to Baxter Travenol Laboratories, Inc. Molded glove and form therefor having textured wrist portion for the elimination of cuff roll-down. 4,133,624, Cl. 425-275.000.
Hecht, Victor. Carburetor atomizer. 4,133,849, Cl. 261-78.00R.
Heidelberger Druckmaschinen AG: *See*—
Schilling, Paul, 4,133,263, Cl. 101-409.000.
Heideman, Robert J.: *See*—
Dressell, Richard G., Jr.; and Heideman, Robert J., 4,133,415, Cl. 188-285.000.
Heidrick, Joseph A., Jr. Trailer carrier. 4,133,440, Cl. 214-506.000.
Heilman, William J.: *See*—
Antonoplos, Patricia A.; and Heilman, William J., 4,133,792, Cl. 260-30.200.
Heinemann, Otto; Schmits, Heinz-Herbert; and Baldus, Heinz-Dieter, to Polysius AG. Roller mill with removable separator structure. 4,133,488, Cl. 241-79.000.
Heintz, Richard P., to Pneumo Corporation. Combined feedback control system. 4,133,250, Cl. 91-363.00A.
Helix Technology Corporation: *See*—
Larsen, John E., 4,134,016, Cl. 250-392.000.
Helliwell, Bradley A.; and Baichtal, James R., to TRW, Inc. Multifrequency sender/receiver in a multi-time slot digital data stream. 4,133,979, Cl. 179-15.0BY.
Hellyer, James A.; Lambert, David S.; and Mermelstein, Robert, to Procter & Gamble Company, The. Detergent composition containing semi-polar nonionic detergent and alkaline earth metal anionic detergent. 4,133,779, Cl. 252-547.000.
Helmle, Anton: *See*—
Eckstein, Ernest; Helmle, Anton; Perlin, Jordan; and Spitalnik, Irving, 4,133,252, Cl. 93-35.00H.
Helper Industries, Inc.: *See*—
Gates, F. Alan, 4,133,437, Cl. 214-75.00R.
Hemphill, Charles W. Backhoe bucket adapter bushing and pin method and apparatus. 4,133,121, Cl. 37-118.00R.
Henderson, Claude L.; and Abner, Edmund L., to General Aviation Electronics, Inc. Modular radio. 4,134,070, Cl. 325-15.000.
Henderson, David, to Binks Manufacturing Company. Plural component gun. 4,133,483, Cl. 239-118.000.

Hendricks, Charles D., to United States of America, Energy. Method for producing small hollow spheres. 4,133,854, Cl. 264-10.000.
Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA): *See*—
Schmidt-Dunker, Manfred; and Greb, Wolfgang, 4,133,872, Cl. 424-1.000.
Hennig, Ewald M. C.: *See*—
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Henshaw, Bruce C.; and Lubbock, Frederick J., to Dulux Australia Ltd. Process for preparing a film-forming material. 4,133,785, Cl. 260-22.0CB.
Henter, Theodore C., Jr. Hydraulic suspension system for vehicle wheels. 4,133,555, Cl. 280-709.000.
Herbert, Peter J.: *See*—
Lloyd, Ronald; Murphy, William O.; Patchell, Albert G.; and Herbert, Peter J., 4,133,310, Cl. 128-156.000.
Hercules Incorporated: *See*—
Blunt, Harry W., 4,133,923, Cl. 428-35.000.
Hergert, Richard E., to Beloit Corporation. Headbox and holders for floating slice chamber dividers. 4,133,715, Cl. 162-341.000.
Herman, Bruce A.; and Stewart, Harold F., to United States of America, Health, Education & Welfare. Parabolic focussing thermal detector for low level ultrasonic power measurements. 4,133,212, Cl. 73-647.000.
Herrmann, Lothar, to Wilhelm Hegenscheidt GmbH. Boring device. 4,133,399, Cl. 175-384.000.
Hersberger, Pierre: *See*—
Scherrer, Igor; and Hersberger, Pierre, 4,133,169, Cl. 58-23.00R.
Hershberger, David L., to Harris Corporation. Dynamic transient response filter. 4,134,074, Cl. 328-169.000.
Herzer, William P.; and Cullen, Robert E., to Union Special Corporation. Automatic sewing machine. 4,133,275, Cl. 112-121.120.
Heurtey Metallurgie: *See*—
Wang, Robert, 4,133,634, Cl. 432-2.000.
Hewitt, Martin: *See*—
Robinson, Stephen P.; Evans, David C.; and Hewitt, Martin, 4,134,141, Cl. 360-90.000.
Hewlett, Clarence W., Jr., to General Electric Company. Circuit for separating a composite stream of data and clock pulses. 4,133,978, Cl. 179-15.0BS.
Heymanns, Lothar, to Wilhelm Hegenscheidt GmbH. Combined precision boring and burnishing tool. 4,133,089, Cl. 29-90.00R.
HI-G, Incorporated: *See*—
Laverick, Eric W.; and Wesp, Clyde E., 4,133,594, Cl. 339-95.00D.
Hickey, Thomas N.: *See*—
Hoy, David R.; Hickey, Thomas N.; Spulgis, Ivars S.; and Parish, Harold C., 4,133,651, Cl. 55-75.000.
Hida, Katsuaki; Matsushima, Tadasu; Ishida, Yasuhiko; and Nakano, Yoshihira, to Shin Nippon Koki Co., Ltd. Thrusting force detecting device of a rotary machining tool. 4,133,206, Cl. 73-133.00R.
Hidveghy, Ivan: *See*—
Kosak, Wolfgang; Werner, Peter; Gerber, Hans; and Hidveghy, Ivan, 4,134,038, Cl. 318-245.000.
High Voltage Engineering Corporation: *See*—
Milde, Helmut I., 4,133,649, Cl. 55-2.000.
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Takeuchi, Yo; Morikawa, Masaki; Tanaka, Chuji; and Hiji, Tosiharu, 4,134,001, Cl. 219-137.00R.
Hijikata, Akiko: *See*—
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,133,880, Cl. 424-244.000.
Hikobe, Kokichi; and Hikobe, Kyoichi. Room temperature crimping of fibrillated film material. 4,133,088, Cl. 28-279.000.
Hikobe, Kyoichi: *See*—
Hikobe, Kokichi; and Hikobe, Kyoichi, 4,133,088, Cl. 28-279.000.
Hildebrand, Bernard P.: *See*—
Russell, James T.; and Hildebrand, Bernard P., 4,133,600, Cl. 350-3.720.
Hildebrandt, William J., to Stanley Works, The. Saw buck bracket and saw buck assembly employing same. 4,133,412, Cl. 182-154.000.
Hill, David T.; Lantos, Ivan; and Sutton, Blaine M., to SmithKline Corporation. Process and intermediate for preparing auranofin. 4,133,952, Cl. 536-121.000.
Hill, John M.; and Garnish, Brian R., to Becorit (G.B.) Limited. Apparatus for treating exhaust gas. 4,133,654, Cl. 55-222.000.
Hill, William H. Separation of hydrocarbons from oil shales and tar sands. 4,133,742, Cl. 208-11.00R.
Hillman, Jeffrey D., to Forsyth Dental Infirmary for Children. Method of controlling dental caries with streptococcus mutans mutant strains. 4,133,875, Cl. 424-93.000.
Himes, Glenn R., to Shell Oil Company. Crepe soles. 4,133,795, Cl. 260-33.6AQ.
Hinuma, Takayuki: *See*—
Seino, Koichi; Omura, Hiroshi; Hinuma, Takayuki; and Hirota, Jyuzo, 4,133,924, Cl. 428-164.000.
Hipoint Research, Inc.: *See*—
Koontz, Paul G.; Wright, Richard L.; and Cantu, Arthur M., 4,134,019, Cl. 250-439.00R.
Hirai, Jun, to Sony Corporation. Color recorder having means for reducing luminance crosstalk in displayed image. 4,134,126, Cl. 358-4.000.
Hirota, Jyuzo: *See*—
Seino, Koichi; Omura, Hiroshi; Hinuma, Takayuki; and Hirota, Jyuzo, 4,133,924, Cl. 428-164.000.
Hitachi Chemical Company, Ltd.: *See*—
Kato, Mitsuharu; Kikuchi, Toru; and Saito, Takayuki, 4,133,965, Cl. 568-723.000.
Hitachi, Ltd.: *See*—
Arai, Takao; Okada, Shigeru; Tomatsuri, Kouichi; and Toeda, Hiroshi, 4,134,078, Cl. 330-254.000.
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Hitachi Maxell, Ltd.: *See*—
Oshimura, Masakazu; Yokoyama, Kenichi; Hayashi, Yukihiro; and Miyake, Akira, 4,133,676, Cl. 75-0.5AA.
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Ishii, Shigeki, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument with attack repeat effect. 4,133,244, Cl. 84-1.260.
Hoch, Helmut: *See*—
Scheuermann, Horst; and Hoch, Helmut, 4,133,828, Cl. 260-508.000.
Hoch, Manfried L., to International Harvester Company. Forage harvester throat sheets. 4,133,165, Cl. 56-2.000.
Hodgman, Elizabeth L.; and Hodgman, Robert O., to Hodgman, Elizabeth L. Protective arrangement for beauty salon patron. 4,133,052, Cl. 2-174.000.
Hodgman, Robert O.: *See*—
Hodgman, Elizabeth L.; and Hodgman, Robert O., 4,133,052, Cl. 2-174.000.
Hodits, Frank W., Jr.: *See*—
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Hoechst Aktiengesellschaft: *See*—
Fernholz, Hans; Schmidt, Hans-Joachim; Wunder, Friedrich; and Roscher, Gunter, 4,133,962, Cl. 560-245.000.
Graser, Reinhold, 4,133,870, Cl. 423-388.000.
Schinzel, Erich, 4,133,953, Cl. 542-454.000.
Hoehn, Marvin M.: *See*—
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Hoffman, Jacob M., Jr.: *See*—
Bolhofer, William A.; Cragoe, Edward J., Jr.; and Hoffman, Jacob M., Jr., 4,133,885, Cl. 424-256.000.
Hoffmann, Kurt; and Mauthe, Manfred, to Siemens Aktiengesellschaft. Fast-switching digital differential amplifier system for CCD arrangements. 4,134,033, Cl. 307-362.000.
Hoffmann-La Roche Inc.: *See*—
Chadha, Naresh K.; Partridge, John J., Jr.; and Uskokovic, Milan R., 4,133,818, Cl. 260-343.30P.
Hofmann, Helmut J. Cleaning apparatus for submerged surfaces. 4,133,068, Cl. 15-1.700.
Hofmann, Karl; and Mladek, Walter, to Robert Bosch GmbH. Clamping device for fuel injection nozzles. 4,133,321, Cl. 123-32.00R.
Hofmeister, Josef, to Hofmeister Kasewerk OHG. Process cheese with liver additive. 4,133,902, Cl. 426-582.000.
Hofmeister Kasewerk OHG: *See*—
Hofmeister, Josef, 4,133,902, Cl. 426-582.000.
Hogg, John A. Modular beehive construction and component therefor. 4,133,065, Cl. 6-1.000.
Holcroft, William L., to Hashimoto, George. Cooling system for marine engines. 4,133,284, Cl. 115-75.000.
Holland Company: *See*—
Chierici, Osvaldo F., 4,133,434, Cl. 213-61.000.
Hollander, Betty R.; and McKinley, William E., to Omega Engineering Inc. Cold junction thermocouple compensator. 4,133,700, Cl. 73-361.000.
Hollmann, Alfred G.: *See*—
Berard, Louis N.; Hollmann, Alfred G.; and Stein, Leonard A., 4,133,140, Cl. 49-49.000.
Holloway, Richard L.; Edison, Robert R.; and Wachtel, Stephen J., to Atlantic Richfield Company. Catalytic reactor-fractionator apparatus. 4,133,644, Cl. 422-138.000.
Holmes, Gordon; and Martin, Geoffrey R., to Albro Fillers and Engineering Company Ltd. Vacuum charging of containers from bulk supply. 4,133,281, Cl. 141-1.000.
Holmes, Jerry D., to Eastman Kodak Company. Process for the production of carboxylic acids. 4,133,963, Cl. 562-519.000.
Holmes, Kenneth P., to Esquire, Inc. High frequency circuit for operating a high-intensity gaseous discharge lamp. 4,134,044, Cl. 315-209.00R.
Holmes, Richard E., to Eli Lilly and Company. Substituted pyrroloquinoxalinones and diones used in treating inflammation in warm blooded mammals. 4,133,884, Cl. 424-250.000.
Holtam, John R.; Ford, Donald J.; and Freeman, Roger A., to Smiths Industries Limited. Altimeter. 4,133,209, Cl. 73-387.000.
Homburg, Axel: *See*—
Diesinger, Walter; and Homburg, Axel, 4,133,265, Cl. 102-92.700.
Home Metal Products Company: *See*—
Burton, Fred, Jr.; Gartenlaub, Marshall N.; and Sampsel, Kenneth E., 4,133,300, Cl. 126-299.00D.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Ito, Hiroshi, 4,133,091, Cl. 29-33.00K.
Sanada, Rentaro; and Kawada, Shigeo, 4,133,193, Cl. 70-183.000.
Yagi, Toru; and Nakamura, Akihisa, 4,133,324, Cl. 123-117.00A.
Honeywell Inc.: *See*—
Jacobsen, William F., 4,134,022, Cl. 250-577.000.
Honeywell Information Systems Inc.: *See*—
MacGregor, William W., 4,134,073, Cl. 328-63.000.

Honganen, Ronald E.: *See*—
Bakalyar, Stephen R.; and Honganen, Ronald E., 4,133,767, Cl. 210-31.00C.

Honikman, Terence C., to Cooper, Allen K., a part interest. Freeze protection for solar heating systems. 4,133,338, Cl. 126-271.000.

Hooey, Keith E.: *See*—
Sandoz, Oscar A.; and Hooey, Keith E., 4,134,119, Cl. 343-703.000.

Hoover Company, The: *See*—
Boyd, Wilton E.; and Bowers, Donald R., 4,133,971, Cl. 174-46.000.

Hoover, John R. E.: *See*—
Dunn, George L.; and Hoover, John R. E., 4,133,882, Cl. 424-246.000.

Hopkins, Robert S., Jr., to RCA Corporation. Digital video synchronizer. 4,134,131, Cl. 358-149.000.

Hopp, Hans: *See*—
Perkow, Werner; Hopp, Hans; Ingwersen, Walter; and C.F. Spiess & Sohn, 4,133,892, Cl. 424-300.000.

Hori, Kenji: *See*—
Nakamura, Hirokazu; Ohinouye, Tsuneo; Hori, Kenji; Kiyota, Yuhiko; Nakagami, Tatsuro; Tsukamoto, Yutaka; and Akishino, Katsuo, 4,133,322, Cl. 123-75.00B.

Horiishi, Nanao: *See*—
Matsui, Goro; Toda, Koji; Takedoi, Atushi; and Horiishi, Nanao, 4,133,677, Cl. 75-0.5AA.

Horiuchi, Takeshi: *See*—
Morimatsu, Yasuo; Tanaka, Toshio; Okumura, Nobuya; and Horiuchi, Takeshi, 4,133,801, Cl. 528-75.00R.

Hosbein, Hugh W., to Mossberg Hubbard a Division of Wanskuck Company. Wire carrying spool and apparatus for support and lifting thereof. 4,133,435, Cl. 214-1.00D.

Hosoe, Kazuya; Asaeda, Tsuyoshi; Yokota, Hideo; and Shingu, Tamotsu, to Canon Kabushiki Kaisha. Method and system for detecting sharpness of an object image. 4,133,606, Cl. 354-25.000.

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Hubbard, Arthur L., to Deere & Company. Cotton picker bar lubricant seal. 4,133,166, Cl. 56-44.000.

Huber, John G.: *See*—
August, Arthur; and Huber, John G., 4,133,711, Cl. 156-353.000.

Huber, William J., to McGraw-Edison Company. Fuse element. 4,134,094, Cl. 337-292.000.

Huda, Josef; Coenenberg, Heinrich; and Aubry, Friedhelm, to Balcke-Durr Aktiengesellschaft. Apparatus for bending large area construction units. 4,133,198, Cl. 72-321.000.

Hughes Aircraft Company: *See*—
Gerard, Henry M.; and Snow, Philip B., 4,134,087, Cl. 333-72.000.
Moulin, Norbert L., 4,133,593, Cl. 339-94.00R.
Riggs, Denton D.; and Wagner, Gene A., 4,134,114, Cl. 343-17.20R.

Hughes, Robert F.: *See*—
Burton, Robert S., III; Chambers, Carlon C.; and Hughes, Robert F., 4,133,380, Cl. 166-259.000.

Huin, Roland: *See*—
Boret, Roger; Bronner, Charles; Huin, Roland; and Vidal, Andre, 4,133,743, Cl. 208-64.000.

Hull, Ezekiel H., to Pfizer Inc. Production of N,N-di(ethyl)-meta-toluamide from meta-toluic acid by liquid phase catalytic reaction with diethylamine. 4,133,833, Cl. 260-558.00R.

Hulls, Leonard R.; and Hadden, Stephen C., to RCA Corporation. Identification of engine cylinder having fault. 4,133,205, Cl. 73-117.300.

Humphrey, Harold W., Jr.: *See*—
Benson, Carl F.; and Humphrey, Harold W., Jr., 4,133,332, Cl. 123-198.00F.

Hundley, Gary L.: *See*—
Nafziger, Ralph H.; Hundley, Gary L.; and Jordan, Ronald R., 4,133,967, Cl. 13-9.0ES.

Hungerford, William R., to Bendix Corporation, The. Absolute resolver angle to digital converter circuit. 4,134,106, Cl. 340-347.0SY.

Hunter, Byron A.; and Prager, Irwin A., to Uniroyal, Inc. Blowing agents -bis(hydrocarbylsulfonyl) carbohydrazides. 4,133,832, Cl. 260-554.000.

Hunter, Edwin J.; and Hunter, Richard E., to Toro Company, The. Power transmission for self-propelled irrigation system. 4,133,344, Cl. 137-344.000.

Hunter, Richard E.: *See*—
Hunter, Edwin J.; and Hunter, Richard E., 4,133,344, Cl. 137-344.000.

Hurd, Everett C. Easily disassembled hinge assembly. 4,133,061, Cl. 4-236.000.

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Pusa, Ilkka; and Hurskainen, Oiva, 4,133,093, Cl. 29-434.000.

Hurson, James K. Clamp. 4,133,081, Cl. 24-73.00A.

Hurst, Robert N., to RCA Corporation. Television picture size altering apparatus. 4,134,128, Cl. 358-22.000.

Husqvarna AB: *See*—
Stahre, Hakan A. L.; and Glantz, Dane E. R., 4,133,358, Cl. 144-3.00D.

Huston, Paul O.: *See*—
Kippel, Edward A.; and Huston, Paul O., 4,133,656, Cl. 55-274.000.

Huxtable, James T.; Miller, Robert G.; and Robinson, Tommy E., to Caterpillar Tractor Co. Error-rejecting data transmission system. 4,134,103, Cl. 340-146.1AB.

Hwang, Chong-Dai: *See*—
Shin, Kyoung-Ho; and Hwang, Chong-Dai, 4,133,519, Cl. 269-247.000.

Hydragon Corporation: *See*—
Earnest, Ernest R.; and Passinos, Bill, 4,133,171, Cl. 60-39.18B.

Hydril Company: *See*—
Lewis, George E.; and Bollfrass, Charles A., 4,133,095, Cl. 29-458.000.

Hynes, Roy G.: *See*—
Stewart, John A.; and Hynes, Roy G., 4,134,102, Cl. 340-58.000.

Ichijima, Seiji; and Furutachi, Nobuo, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive element. 4,133,686, Cl. 96-74.000.

Ichikawa, Kiyoshi: *See*—
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Ishii, Shigeki, 4,133,244, Cl. 84-1.260.

Ichimura, Masahiko: *See*—
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Idram Engineering Company Est.: *See*—
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Ieki, Hiroshi: *See*—
Hachiboshi, Makoto; Matsunami, Koichi; Nagano, Hikoichi; Ieki, Hiroshi; and Oko, Tsutomu, 4,133,802, Cl. 528-502.000.

Iglio, Salvatore: *See*—
Greenwald, Harry; and Iglio, Salvatore, 4,133,419, Cl. 194-1.00B.

Ihms, James E. Method for producing color structure change through interaction of light sources and application to improved apparatus for stereoscopic photography. 4,133,602, Cl. 350-132.000.

Iijima Products M.F.G. Co., Ltd.: *See*—
Nakagawa, Masaru; Saito, Yasuaki; and Okada, Hideaki, 4,133,736, Cl. 204-195.00P.

Ikeda, Hironosuke; Hara, Mitsunori; and Narukawa, Satoshi, to Sanyo Electric Co., Ltd. Process for producing a positive electrode for a non-aqueous cell. 4,133,856, Cl. 264-63.000.

Ikeda, Yorifumi; and Nishikawa, Kikuo, to Takeda Chemical Industries, Ltd. Liquid purification apparatus. 4,133,759, Cl. 210-104.000.

Ikemoto, Kikuji. Ball game device. 4,133,534, Cl. 273-176.00E.

Imangulov, Vakel K.: *See*—
Nudelman, Boris I.; Simma, Ilya Y.; Uvarova-Nistratova, Ida T.; Lisbaron, Vitaly I.; Kalantarov, Grigory I.; and Imangulov, Vakel K., 4,133,693, Cl. 106-100.000.

Imperial Chemical Industries Limited: *See*—
Barker, Sidney A.; Somers, Peter J.; and Woodbury, Robin R., 4,133,696, Cl. 127-46.00A.
Cartwright, David; and Urlwin-Smith, Philip L., 4,133,674, Cl. 71-93.000.
Cooper, Richard R.; and Whiteley, Kenneth S., 4,133,944, Cl. 526-65.000.
Lilley, Brian C., 4,133,515, Cl. 266-120.000.
Ratter, Henry, 4,133,451, Cl. 220-461.000.
Steer, David C.; and Williams, Hugh L., 4,133,904, Cl. 426-656.000.
Taubinger, Robert P. L. V.; and Rashbrook, Robert B., 4,133,800, Cl. 260-45.7PH.

Inaba, Seiuemon; Shimajiri, Tokiji; and Oyama, Shigeaki, to Fujitsu Fanuc Limited. Machine tool. 4,133,230, Cl. 82-28.00R.

Inamoto, Yoshiaki; Tsuchihashi, Kiyoshi; Takaishi, Naotake; and Fujikura, Yoshiaki, to Kao Soap Co., Ltd. Preparation of 4-homoisotwistane, (tricyclo[5.3.1.0^{3,9}]undecane). 4,133,840, Cl. 260-666.0PY.

Indesit Industria Elettrodomestici Italiana S.p.A.: *See*—
Campioni, Armando, 4,134,127, Cl. 358-16.000.
Zappala', Giuseppe, 4,134,047, Cl. 315-408.000.

Indian Head Inc.: *See*—
Wilson, Nelson H., 4,133,177, Cl. 60-358.000.

Industrial Knitting, Inc.: *See*—
Mintz, Marcus, 4,133,164, Cl. 53-261.000.

Industrial Molding Corporation: *See*—
Earsley, Melvin L., 4,133,588, Cl. 308-201.000.

Ingersoll-Rand Company: *See*—
Kirk, Robley G., 4,133,541, Cl. 277-65.000.

Ingwersen, Walter: *See*—
Perkow, Werner; Hopp, Hans; Ingwersen, Walter; and C.F. Spiess & Sohn, 4,133,892, Cl. 424-300.000.

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Slagley, William E.; and Strangway, Peter K., 4,133,373, Cl. 165-11.000.

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Suzuki, Takeo; Inoue, Ikutaro; Tamai, Hideo; and Aoki, Masatsugu, 4,133,422, Cl. 400-154.500.

Inoue, Mitsumasa, to Nissan Motor Company, Ltd. Fuel vaporizing heat exchanger for an internal combustion engine. 4,133,327, Cl. 123-122.0AC.

Inoue, Tomio: *See*—
Fukui, Katsuo; and Inoue, Tomio, 4,134,056, Cl. 320-20.000.

Inouye, Hajime, deceased; and by Inouye, Mika, executrix. Extra hand magnifying glass. 4,133,603, Cl. 350-248.000.

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Inouye, Hajime, deceased; and Inouye, Mika, executrix, 4,133,603, Cl. 350-248.000.

Institut Elektrosvarki Imeni E.O. Patona Adakemii Nauk: *See*—
Lakomsky, Viktor I.; Grigorenko, Georgy M.; Torkhov, Gennady F.; Melnik, Gary A.; and Nesmikh, Vitaly S., 4,133,987, Cl. 219-121.00P.

Institut Francais du Petrole: *See—*
Boret, Roger; Bronner, Charles; Huin, Roland; and Vidal, Andre, 4,133,743, Cl. 208-64.000.
Cosyns, Jean; Chauvin, Yves; Juguin, Bernard; Le Page, Jean-Francois; and Miquel, Jean, 4,133,841, Cl. 260-676.00R.
Institut National de la Sante et de la Recherche Medicale (Inserm): *See—*
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International Business Machines Corporation: *See—*
Bernardelli, William J.; Caudill, Allison H.; and Thompson, John A., 4,133,610, Cl. 355-3.0CH.
Vogel, Marcel J.; and Vogel, Siegfried F., 4,134,066, Cl. 324-210.000.
International Diagnostic Technology, Inc.: *See—*
Harte, Richard A., 4,133,639, Cl. 23-230.00B.
International Harvester Company: *See—*
Hoch, Manfried L., 4,133,165, Cl. 56-2.000.
International Mechanical Contractors, Inc.: *See—*
Glennon, Thomas J., 4,133,273, Cl. 110-346.000.
International Minerals & Chemical Corp.: *See—*
Harris, Robert R.; and Pollack, Warren J., 4,133,786, Cl. 260-22.0CB.
International Nickel Company, Inc., The: *See—*
Turillon, Pierre P.; and Sandrock, Gary D., 4,133,426, Cl. 206-0.700.
International Standard Electric Corporation: *See—*
Dobler, Karl-Ulrich; and Spannagel, Richard, 4,133,504, Cl. 246-5.000.
Rein, Wolf-Heider, 4,134,139, Cl. 360-44.000.
International Telephone & Telegraph Corp.: *See—*
Dippold, Walter J., 4,134,009, Cl. 250-205.000.
Eberhardt, Edward H., 4,134,010, Cl. 250-213.0VT.
Powell, Lloyd J., 4,133,599, Cl. 339-258.00R.
Inventing S.A.: *See—*
Wallsten, Hans I., 4,133,917, Cl. 427-209.000.
Ioffe, Lazar O.: *See—*
Vorobiev, Jury P.; Ivanov, Jury S.; Ioffe, Lazar O.; Karpacheva, Susanna M.; Kukurechenko, Irina S.; Muratov, Valerian M.; Serebryakov, Viktor P.; and Shiyanov, Viktor A., 4,133,714, Cl. 162-237.000.
Ionics Inc.: *See—*
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Isaksen, Robert A.; Locke, Frederic J.; Smith, John L.; and Spitz, George T., to Monsanto Company. Powder coating resin process. 4,133,843, Cl. 260-850.000.
Ishida, Yasuhiko: *See—*
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Ishikawa, Makio; and Kanazawa, Hikaru. Electronic air conditioner. 4,133,652, Cl. 55-126.000.
Ishikawa, Masakazu; and Chuwman, Tsutomu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Plug and attaching hole thereof. 4,133,560, Cl. 285-81.000.
Ito, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for fixing blades on turbine wheel for fluid coupling made of sheet metal. 4,133,091, Cl. 29-33.00K.
Ivanov, Jury S.: *See—*
Vorobiev, Jury P.; Ivanov, Jury S.; Ioffe, Lazar O.; Karpacheva, Susanna M.; Kukurechenko, Irina S.; Muratov, Valerian M.; Serebryakov, Viktor P.; and Shiyanov, Viktor A., 4,133,714, Cl. 162-237.000.
J. M. Huber Corporation: *See—*
Bertorelli, Orlando L.; and Fitton, Robert C., 4,133,694, Cl. 106-288.00B.
Jackson, Joseph E., to Jones, Lewis E.; and McMahan, Forrest E., part interest to each. Machine for making cellulose insulation. 4,133,490, Cl. 241-101.600.
Jacobs, Eli S.: *See—*
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Jacobs, Israel S.; Lahut, Joseph A.; and Grossman, Leonard N., to General Electric Company. Method and apparatus for magnetically determining the Gd_2O_3 content in UO_2 fuel pellets while eliminating the effect of ferromagnetic impurities. 4,134,064, Cl. 324-201.000.
Jacobs, Jacob L. Food-handling device. 4,133,238, Cl. 83-762.000.
Jacobs, Paul F.; Thourson, Thomas L.; and Speiser, Robert C., to Xerox Corporation. Single wire microelectrometer imaging system. 4,134,137, Cl. 358-293.000.
Jacobsen, William F., to Honeywell Inc. Frequency sensitive level detecting apparatus. 4,134,022, Cl. 250-577.000.
Jacques, Andre: *See—*
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Jaeger, Ben E. Sampling apparatus. 4,133,210, Cl. 73-424.000.
Janian, Robert; and Boyer, Rolla J. Spring seal. 4,133,542, Cl. 277-152.000.
Jannone, Joseph. Apparatus for spraying liquids in mono-dispersed form with capacity to control the quantity of spray. 4,133,484, Cl. 239-214.250.
Janssen, George A. Sling shot. 4,133,333, Cl. 124-20.00R.
Jaquay, Louis H., to Dravo Corporation. Method for agglomerating finely divided agglomerative materials in a rotary drum assembly. 4,133,718, Cl. 201-6.000.
Jaske, Robert F., to Sprague Devices, Inc. Windshield wiper arm. 4,133,071, Cl. 15-250.040.
Jasniewicz, Zbigniew; Knyszewski, Jan; Osrodek, Tadeusz; and Stefanski, Lech, to Prezedsiebiorstwo Polowow Dalekomorskich i Uslug Rybackich "Dalmor". Method for obtaining of meat from marine crustacea, especially from Antarctic krill. 4,133,077, Cl. 17-48.000.
Jay A. Smart Research, Ltd.: *See—*
Smart, Jay A., 4,133,364, Cl. 160-84.00R.
Jelinek, Heinz; and Carmann, Fritz. Rapid loading device for revolvers. 4,133,129, Cl. 42-89.000.
Jelinek, Horst; Elsenheimer, Gerd; and Klersy, Bernhard, to Metallgesellschaft Aktiengesellschaft. Process of separating solid granular metallurgical products and their precursors and apparatus. 4,133,749, Cl. 209-24.000.
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Jenaer Glaswerk Schott & Gen.: *See—*
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Jenkins, Herndon: *See—*
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Jenkins, Robert A., Sr., to Solar Reflective Film, Inc. Screen mounting arrangement. 4,133,366, Cl. 160-328.000.
Jensen, Bruce W.; and Bacon, David L., to Livingston, Lawrence E.; and Livingstone, Victoria A. Woodsplitter. 4,133,359, Cl. 144-193.00R.
Jerpbak, Jeffery P. Apparatus embodying explosively removable sleeve. 4,133,460, Cl. 222-386.000.
Jeumont-Schneider: *See—*
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Jewell, Michael A.: *See—*
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Johns, Robert L. Shoe display device and method. 4,133,589, Cl. 312-125.000.
Johnson, Henry B., to Black and Decker Manufacturing Company, The. Chuck key. 4,133,543, Cl. 279-1.00K.
Johnson, Jesse R., to Knowles, Coyle E.; and Fisher, Eugene L., part interest to each. Butterfly valve construction. 4,133,512, Cl. 251-173.000.
Johnson, Michael R., to Pfizer Inc. Hexahydro-1-hydroxy-9-hydroxymethyl-3-substituted-6H-dibenzo[b,d]pyrans as analgesic agents. 4,133,819, Cl. 260-345.300.
Johnson, Russell C.; and Bey, Russell F., to University of Minnesota, The Regents of the. Protein-free nutrient medium. 4,133,717, Cl. 195-100.000.
Jolly, Ramesh C.: *See—*
Kosikowski, Frank V.; and Jolly, Ramesh C., 4,133,895, Cl. 426-33.000.
Jonas, Adam: *See—*
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Jones, C. David; and Suarez, Tulio, to Eli Lilly and Company. 2-Phenyl-3-aroylbenzothiophenes useful as antifertility agents. 4,133,814, Cl. 260-326.55A.
Jones, Ernest L. Cattle gate for rodeo. 4,133,295, Cl. 119-15.50R.
Jones, John P., Jr., to Air Products and Chemicals, Inc. Protective circuit for electronic motor vehicle engine operating timers. 4,134,101, Cl. 340-52.00D.
Jones, Lewis E.: *See—*
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Jones-Steele, Debbie. Portable infant layette. 4,133,063, Cl. 5-99.00R.
Jordan, Robert K., to Idram Engineering Company Est. Isocyanates process III. 4,133,868, Cl. 423-365.000.
Jordan, Ronald R.: *See—*
Nafziger, Ralph H.; Hundley, Gary L.; and Jordan, Ronald R., 4,133,967, Cl. 13-9.0ES.
Joschko, Gunter; and Albrecht, Peter, to TED Bildplatten Aktiengesellschaft AEG-Telefunken-Teldec. Method for producing a grinding agent carrier. 4,133,145, Cl. 51-295.000.
Joslyn Mfg. and Supply Co.: *See—*
Lusk, George E., 4,133,970, Cl. 174-19.000.
Joyce, Samuel F., III; Morgan, Albert W.; Touchette, Norman W.; and Vanderlinde, William, to Monsanto Company. Reaction products of metal oxides and salts with phosphorus compounds. 4,133,823, Cl. 260-439.00R.
Judd, Edwin B., to General Electric Company. Momentary contact switch with compensating spring. 4,133,993, Cl. 200-153.00K.
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K-tel International, Inc.: *See*—
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Kalbow, William H.; and Kalbow, Wayne R. Article mounting assembly. 4,133,509, Cl. 248-313.000.
Kalfoglou, George, to Texaco Inc. Oxidized lignosulfonates as additives in oil recovery processes involving chemical recovery agents. 4,133,385, Cl. 166-273.000.
Kalka, Josef; Winter, Hermann; and Kania, Alfred, to Chemische Werke Huels Aktiengesellschaft. Process for production of polymers of vinyl chloride for paste preparation using spray-drying. 4,133,947, Cl. 528-502.000.
Kamiya, Minoru. Method for manufacturing self-locking spring nut. 4,133,066, Cl. 10-86.00A.
Kanazawa, Hikaru: *See*—
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Kane, Jeffrey, to Ferranti Limited. Semiconductor devices and circuit arrangements including such devices. 4,134,124, Cl. 357-48.000.
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Kalka, Josef; Winter, Hermann; and Kania, Alfred, 4,133,947, Cl. 528-502.000.
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Kanzaka, Yoshihiro, to Yoshida Kogyo K.K. Adjustable fastening device. 4,133,082, Cl. 24-206.00R.
Kao Soap Co., Ltd.: *See*—
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Kaplan, Saul; Merianos, John J.; Green, Harold A.; and Petrocci, Alfonso N., to Kewanee Industries, Inc. Aqueous detergent compositions containing amphoteric surfactants having anti-microbial and preservative properties. 4,133,772, Cl. 252-106.000.
Kappler, Gunter: *See*—
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Karczewski, Robert A. Ankle support structure. 4,133,311, Cl. 128-166.000.
Karlen, Harry K. G.: *See*—
Andersson, John N. J.; Karlen, Harry K. G.; and Ulfhielm, Lennart A. U., 4,133,972, Cl. 174-47.000.
Karpacheva, Susanna M.: *See*—
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Karras, Ernest. Device for displaying data in three dimensions. 4,134,104, Cl. 340-780.000.
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Eppens, Hindrik E. H., 4,134,005, Cl. 219-413.000.
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King, Jack B., to General Motors Corporation. Proportional fuel vapor purge flow control apparatus. 4,133,328, Cl. 123-136.000.
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Klassen, Edward J. Squeeze bottle with valve septum. 4,133,457, Cl. 222-212.000.
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Klemt, Arthur. Method of classifying characters having characteristics that differ greatly from standard characters. 4,134,021, Cl. 250-567.000.

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Jelinek, Horst; Elsenheimer, Gerd; and Klersy, Bernhard, 4,133,749, Cl. 209-24.000.
Klie, Wolfgang: *See*—
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Klinger, Friedrich, to Carl Schenck AG, Firma. Testing apparatus for vehicles axles. 4,133,201, Cl. 73-12.000.
Klinger, Lance T., to Xerox Corporation. Method and means for capturing magnetic tracks. 4,134,053, Cl. 318-561.000.
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Akiyama, Taichiro, 4,133,984, Cl. 179-107.00E.
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Koltse, John G. Apparatus and method for continuous plating bath treatment system. 4,133,757, Cl. 210-75.000.
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Kontz, Robert F., to Owens-Illinois, Inc. Apparatus for molding plastic articles. 4,133,627, Cl. 425-525.000.
Koons, Russell E., to Lion Oil Company. Pipe coating compositions. 4,133,352, Cl. 138-146.000.
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Adie, Richard A., 4,133,766, Cl. 210-275.000.
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Derichs, Josef; and Koslowski, Gerhard, 4,133,492, Cl. 242-150.00R.
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Pittaro, Richard J., 4,134,081, Cl. 331-1.00A.
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Krusoe, John A. Anti-theft device for vehicles. 4,133,410, Cl. 180-114.000.
Kubelka, Axel R., to TMC Corporation. Ski boot. 4,133,119, Cl. 36-121.000.
Kuchenbecker, Morris W., to American Can Company. Package structure. 4,133,429, Cl. 206-465.000.
Kuehnle, Manfred R., to Coulter Systems Corporation. Method of toning an electrophotographic film. 4,133,906, Cl. 427-17.000.
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Kun, Leslie C.: *See*—
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Kuntzsch, Donald W., to Allen-Bradley Company. Terminal block. 4,133,598, Cl. 339-198.00G.
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Sloyan, Jerome J.; and Kuppek, Anton, 4,133,508, Cl. 248-558.000.
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Lakshmanan, Pallavoor R., to Gulf Oil Corporation. Adhesive compo-

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Lamb, Frank, to Ciba-Geigy AG. Polyester plasticizers. 4,133,794, Cl. 260-31.600.
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Lamberti, Vincent: *See*—
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Lampert, Albert J., to Cambria Spring Company. Anti-sway mechanism for motor vehicles. 4,133,554, Cl. 280-689.000.
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Geschwender, Robert C., 4,133,712, Cl. 156-512.000.
Lanier, Juan E., to Ferguson Industries, Inc. Method and apparatus for comminuting solid particles in a fluid stream. 4,133,487, Cl. 241-5.000.
Lankford, Frank L., Jr., to Texaco Inc. System for land seismic cable fault location. 4,134,099, Cl. 340-15.5TS.
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Hill, David T.; Lantos, Ivan; and Sutton, Blaine M., 4,133,952, Cl. 536-121.000.
Lariosa, Oscar A. Self-erecting sign post. 4,133,125, Cl. 40-608.000.
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Latsch, Reinhard: *See*—
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Lavigne, Raymond G.; and Walmet, Gunnar E., to General Electric Company. Heat activatable electrical switch. 4,134,092, Cl. 337-298.000.
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Maire, Jacques; and Gremion, Robert, 4,133,369, Cl. 164-46.000.
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Lee, Choong W. Apparatus and method for growing plants. 4,133,141, Cl. 47-79.000.
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Le Guen, Benoit; and Jacques, Andre, to Thomson-CSF. Optical fibers bundle positioning ferrule. 4,133,601, Cl. 350-96.210.
Lehner, Karl, to Didier Engineering GmbH. Polymer filament manufacturing device having reduced vertical size. 4,133,620, Cl. 425-72.00S.
LeMay, William E.: *See*—
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Levi Strauss & Co.: *See*—
Blessing, Hubert, 4,133,217, Cl. 74-395.000.
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Lewin, George. Work table for saws and other tools. 4,133,237, Cl. 83-467.00R.
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Ohnsorge, Horst, 4,134,071, Cl. 325-42.000.
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Odom, Robert E.; and Lieder, Gaylerd M., 4,133,254, Cl. 93-53.0SD.
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Li, Hsin L.; Oswald, Hendrikus J.; and Liland, Alfred L., 4,133,087, Cl. 28-257.000.
Lilley, Brian C., to Imperial Chemical Industries Limited. Heat treatment. 4,133,515, Cl. 266-120.000.
Linde Aktiengesellschaft: *See*—
Wagner, Norbert, 4,133,662, Cl. 62-13.000.
Lindstrom, Alrik C. Container closure. 4,133,462, Cl. 222-546.000.
Linke, Hans-Ralf: *See*—
Batz, Hans-Georg; Linke, Hans-Ralf; Stellner, Klaus; and Weimann, Gunter, 4,133,949, Cl. 536-7.000.
Linn, Michael G.: *See*—
Early, William E.; and Linn, Michael G., 4,133,144, Cl. 51-294.000.
Linton, Jonathan L., to Therm-O-Disc Incorporated. Adjustable thermostat. 4,133,286, Cl. 116-313.000.
Lion Oil Company: *See*—
Koons, Russell E., 4,133,352, Cl. 138-146.000.
Lipp, Herbert, to Rheinmetall GmbH. Ammunition loading and ejection arrangement. 4,133,126, Cl. 42-23.000.
Lisbaron, Vitaly I.: *See*—
Nudelman, Boris I.; Simma, Ilya Y.; Uvarova-Nistratova, Ida T.; Lisbaron, Vitaly I.; Kalantarov, Grigory I.; and Imangulov, Vakel K., 4,133,693, Cl. 106-100.000.
Litt, Sanford. Scarifying tool for pipe ends. 4,133,070, Cl. 15-106.000.
Litton Systems, Inc.: *See*—
Buck, Ronald G., 4,133,995, Cl. 219-10.55M.
Thuleen, Richard A., 4,133,997, Cl. 219-10.55F.
Livingston, Lawrence E.: *See*—
Jensen, Bruce W.; and Bacon, David L., 4,133,359, Cl. 144-193.00R.
Livingstone, Victoria A.: *See*—
Jensen, Bruce W.; and Bacon, David L., 4,133,359, Cl. 144-193.00R.
Lloyd, Ronald; Murphy, William O.; Patchell, Albert G.; and Herbert, Peter J., to Smith & Nephew Research Limited. Polymer fabric. 4,133,310, Cl. 128-156.000.
Locke, Frederic J.: *See*—
Isaksen, Robert A.; Locke, Frederic J.; Smith, John L.; and Spitz, George T., 4,133,843, Cl. 260-850.000.
Logan, David J., to Gerber Scientific Inc. Apparatus for detecting limits of travel. 4,133,111, Cl. 33-1.00M.
Long, R. H.: *See*—
Davis, H. R.; Long, R. H.; and Simone, A. A., 4,133,758, Cl. 210-83.000.
Lonza Ltd.: *See*—
Boosen, Karl-Josef, 4,133,827, Cl. 260-465.400.
Loomis, Thomas H. Arrow package. 4,133,427, Cl. 206-317.000.
Lord Corporation: *See*—
Howard, Dennis D., 4,133,723, Cl. 204-15.000.
Lorenz, Kurt: *See*—
Choulat, Gustav; Lorenz, Kurt; and Petsch, Egon, 4,133,643, Cl. 422-182.000.
Lorenzo, Robert: *See*—
Visceglia, Marco P.; and Lorenzo, Robert, 4,133,762, Cl. 210-186.000.

Lorimor, Larry W., to Caterpillar Tractor Co. Valve spool positioner. 4,133,510, Cl. 251-31.000.

Lourens, Gerhardus J.; and Koekemoer, Johannes M., to Chembro Holdings (Proprietary) Limited. 11-Oxa-prostaglandin analogs. 4,133,817, Cl. 260-340.90P.

Lourens, Gerhardus J.; Koekemoer, Johannes M.; and Venter, Elise M. M., to Chembro Holdings (Proprietary) Limited. Monosaccharides and products resulting therefrom. 4,133,948, Cl. 536-1.000.

Love, Mahlon L., to Deere & Company. Variable speed reversible drive for a harvesting apparatus. 4,133,225, Cl. 74-750.00R.

Love, William J., Jr.: *See*—
Fellnor, John R.; and Love, William J., Jr., 4,133,635, Cl. 432-19.000.

Lowe, Brian A.; and Odell, Raymond, to Racal-Amplivox Communications Ltd. Protective devices. 4,133,308, Cl. 128-145.00R.

Lubbock, Frederick J.: *See*—
Henshaw, Bruce C.; and Lubbock, Frederick J., 4,133,785, Cl. 260-22.0CB.

Lucas Industries, Ltd.: *See*—
Cops, Michael H.; and Sainsbury, Clive R., 4,133,326, Cl. 123-119.0EC.

Luderer, Gunter: *See*—
Weinkauf, Burghard; and Luderer, Gunter, 4,134,018, Cl. 250-445.00T.

Lueck, Dale E., to Ionics Inc. Combustion cone for chemical analysis instrument. 4,133,641, Cl. 422-78.000.

Lummus Company, The: *See*—
Davis, H. R.; Long, R. H.; and Simone, A. A., 4,133,758, Cl. 210-83.000.

Lundin, Tord R., to Gullifiber AB. Ear-pads and assembly procedure. 4,133,053, Cl. 2-209.000.

Lusk, George E., to Joslyn Mfg. and Supply Co. Electrical insulation system. 4,133,970, Cl. 174-19.000.

Lutsenko, Georgy G.: *See*—
Babaskin, Jury Z.; Efimov, Viktor A.; Sokirko, Leonid A.; Rostovskaya, Leonora A.; Shipitsyn, Sergei Y.; Semenyaka, Georgy D.; and Lutsenko, Georgy G., 4,133,680, Cl. 75-129.000.

Lux, Peter, to U.S. Philips Corporation. Apparatus for picture processing. 4,134,134, Cl. 358-280.000.

Lydon, James J., Jr.: *See*—
Arteaga, Eldon F.; and Lydon, James J., Jr., 4,133,531, Cl. 273-102.00R.

Lyon, Floyd A., to Halm Instrument Co. Inc. Solar heat absorber plate. 4,133,299, Cl. 126-271.000.

Lyons, Donald W.: *See*—
Calder, Brooke J., Jr.; Childs, David L.; Prescott, Roger N.; and Lyons, Donald W., 4,133,247, Cl. 86-20.00C.

MacArthur, Samuel E.; and Smith, Stanley N., to Federal-Mogul Corporation. Method of making shaft seal with clinch-butt metal case. 4,133,092, Cl. 29-417.000.

MacGregor, William W., to Honeywell Information Systems Inc. Clock system having adaptive synchronization feature. 4,134,073, Cl. 328-63.000.

MacIver, Bernard A.; and Greenstein, Eugene, to General Motors Corporation. Method of forming diodes by amorphous implantations and concurrent annealing, monocrystalline reconversion and oxide passivation in <100> N-type silicon. 4,133,704, Cl. 148-1.500.

MacIver, Bernard A.: *See*—
Greenstein, Eugene; and MacIver, Bernard A., 4,133,701, Cl. 148-1.500.

Mackniesh, Frank, to FPD Corporation. Golf club carrier. 4,133,467, Cl. 224-52.000.

Macnab, Ian: *See*—
Riley, Victor; Macnab, Ian; Timusk, John; and English, Edward, 4,133,928, Cl. 428-255.000.

Mader, Elmar, to ever-clean GmbH H.W. Nixdorf. Vibration damping means for windshield. 4,133,575, Cl. 296-95.00R.

Madsen, Bruce S., to Western Electric Company, Inc. Method for depositing a metal on a surface. 4,133,908, Cl. 427-53.000.

Mageli, Orville L.: *See*—
Bafford, Richard A.; and Mageli, Orville L., 4,133,835, Cl. 568-558.000.

Magma Copper Company: *See*—
Dopson, Gaylord W., 4,133,746, Cl. 209-1.000.

Magna American Corporation: *See*—
Reaume, Leonard V., 4,133,390, Cl. 172-43.000.

Magos, Gabor; and Szalai, Jozsef, to Villamos Berendezes es Keszulek Muvek. Circuit arrangement for display boards having luminous elements arranged in a matrix. 4,134,132, Cl. 358-240.000.

Maillet, Edgard J. Shredders, notably for processing heterogeneous materials. 4,133,489, Cl. 241-89.000.

Maing, Il-Young; Parliment, Thomas H.; and Soukup, Robert J., to General Foods Corporation. Stabilization of erythrosine in aqueous acidic food systems. 4,133,900, Cl. 426-540.000.

Maire, Jacques; and Gremion, Robert, to Le Carbone-Corrane. Fluid treatment modules. 4,133,369, Cl. 164-46.000.

Malafouris, Dannie O., to Barbecue Time, Inc. Folding tray portable cooking unit. 4,133,335, Cl. 126-9.00R.

Malard, Marcel: *See*—
de Corlieu, Guy; Malard, Marcel; Reymond, Jean-Claude; and Robin, Leon, 4,134,008, Cl. 250-199.000.

Malaysian Rubber Producers' Research Association: *See*—
Bevan, Alfred R.; and Stephens, Ian, 4,133,623, Cl. 425-133.100.

Malkin, Vasily B.: *See*—
Esibyan, Eduard M.; Danchenko, Mikhail E.; Malkin, Vasily B.; Dotsenko, Vsevolod D.; and Asoyants, Grigory B., 4,133,988, Cl. 219-121.00P.

Malpass, Dennis B.; and Merkley, Joseph H., to Texas Alkyls, Inc. Organo-magnesium complexes and process for their preparation. 4,133,824, Cl. 260-448.0AD.

Malpass, Dennis B.: *See*—
Watson, Spencer C.; Malpass, Dennis B.; and Yeargin, G. Scott, 4,133,815, Cl. 260-340.600.

Mandelbaum, Isidore. Pill dispensing and storage device. 4,133,445, Cl. 220-23.400.

Mansho, Etsuo. Camera accessory. 4,133,607, Cl. 354-81.000.

March, Anthony: *See*—
Pelchat, Paul F.; and March, Anthony, 4,134,051, Cl. 318-282.000.
Wanlass, Bert R.; and March, Anthony, 4,134,052, Cl. 318-282.000.

Marchant, Derek N.: *See*—
Norris, Kenneth W.; Bunyard, Alan D.; and Marchant, Derek N., 4,133,215, Cl. 74-89.000.

Marechal-Prost, Jacques: *See*—
Warnant, Julien; Marechal-Prost, Jacques; and Cosquer, Philippe, 4,133,826, Cl. 260-465.00D.

Marie, Gerard: *See*—
de Lallee, Jacques; Marie, Gerard; and Moracchioli, Robert, 4,133,377, Cl. 165-118.000.

Marino, Joseph A.; Gray, Gary A.; and Steiner, Edward, to Xerox Corporation. Fault detection and system for electrostatographic machines. 4,133,477, Cl. 235-304.000.

Markley, Lowell D., to Dow Chemical Company, The. Preferential aliphatic halogenation of ar-substituted alkylbenzenes. 4,133,837, Cl. 260-651.00R.

Marple, Virgil A., to University of Minnesota, The Regents of the. Multiple nozzle single stage impactor. 4,133,202, Cl. 73-28.000.

Marquet, Andre: *See*—
Berthet, Michel; Gillet, Roger; Marquet, Andre; and Moisson-Franckhauser, Francois, 4,134,037, Cl. 310-52.000.

Marsh, Robert. Putting stroke training device. 4,133,535, Cl. 273-192.000.

Martin, Geoffrey R.: *See*—
Holmes, Gordon; and Martin, Geoffrey R., 4,133,281, Cl. 141-1.000.

Martin, Robert P. Guard-cab for cold room. 4,133,574, Cl. 296-28.00C.

Martinu, Jaroslav, to Woodwork Corporation of America. Method for machining joints for miters, grooves and other joinery in a beveled or straight panel edge and apparatus for same. 4,133,361, Cl. 144-323.000.

Marwede, Gunter: *See*—
Beck, Manfred; Marwede, Gunter; and Fritz, Rainer, 4,133,845, Cl. 260-880.00B.

Marzoli, Angelo, to F.lli Marzoli & C. S.p.A. Cleaning device for the scraper blades associated with rotating separation and/or clearing rollers for a textile fibre web in spinning machines. 4,133,073, Cl. 15-308.000.

Masaki, Kenji, to Nissan Motor Company, Ltd. Method of reducing pollutants in engine exhaust gas before emission into the atmosphere. 4,133,174, Cl. 60-285.000.

Masaki, Mitsuo; and Fuzimura, Susumu, to UBE Industries, Ltd. Process for catalytically producing phosgene. 4,133,831, Cl. 260-544.00K.

Maschinenfabrik Lauffer & Butscher: *See*—
Plocher, Werner; and Lauffer, Hans-Martin, 4,133,621, Cl. 425-116.000.

Masi, Paolo; Suarato, Antonino; Giardino, Pietro; Bernardi, Luigi; and Arcamone, Federico, to Societa Farmaceutici Italia S.p.A. Anthracycline ethers and use therefor. 4,133,877, Cl. 424-180.000.

Maso-Therm Corporation: *See*—
Piazza, Matthew R., 4,133,859, Cl. 264-71.000.

Massey-Ferguson Inc.: *See*—
Fox, Anthony E., 4,133,547, Cl. 180-54.00A.

Matriss, Joseph P.: *See*—
Bernstein, Richard; and Matriss, Joseph P., 4,133,110, Cl. 32-2.000.

Matsui, Goro; Toda, Koji; Takedoi, Atushi; and Horiishi, Nanao, to Toda Kogyo Corp. Process for producing acicular magnetic metallic particle powder. 4,133,677, Cl. 75-0.5AA.

Matsunami, Koichi: *See*—
Hachiboshi, Makoto; Matsunami, Koichi; Nagano, Hikoichi; Ieki, Hiroshi; and Oko, Tsutomu, 4,133,802, Cl. 528-502.000.

Matsushima, Tadasu: *See*—
Hida, Katsuaki; Matsushima, Tadasu; Ishida, Yasuhiko; and Nakano, Yoshihira, 4,133,206, Cl. 73-133.00R.

Matsushita Electric Industrial Co., Ltd.: *See*—
Kojima, Shigeru; Kojima, Kiyoshi; and Mitani, Satoru, 4,133,703, Cl. 148-31.570.
Sekine, Yoichi; Shimotsuma, Wataru; and Tsubusaki, Shigeru, 4,133,933, Cl. 428-328.000.
Shiga, Kazumasa, 4,134,150, Cl. 365-222.000.

Matsushita Electric Works, Ltd.: *See*—
Takase, Yosio, 4,133,991, Cl. 200-47.000.

Matthiessen, Otto, to Bayerische Motoren Werke Aktiengesellschaft. Apparatus for measuring a workpiece. 4,133,112, Cl. 33-169.00R.

Maurer, Friedel, to Glyco-Metall-Werke, Daelen & Loos GmbH. Axial slide bearing. 4,133,586, Cl. 308-23.000.

Mauthe, Manfred: *See*—
Hoffmann, Kurt; and Mauthe, Manfred, 4,134,033, Cl. 307-362.000.

Maxwell, Herris M. Method of shipping and assembling rectangular structural unit. 4,133,472, Cl. 228-140.000.

Mayer, Dieter: *See*—
Koester, Eberhard; Deigner, Paul; Falk, Roland; Uhl, Karl; Schaefer, Dieter; Mayer, Dieter; Motz, Herbert; and Felleisen, Peter, 4,133,911, Cl. 427-130.000.

Mayer, Edward A., to Texaco Inc. Sealable dispensing nozzle with automatic shut-off. 4,133,355, Cl. 141-217.000.

Mayville Engineering Company, Inc.: *See*—
Bachhuber, Theodore J.; and Bachhuber, Philip C., 4,133,249, Cl. 86-23.000.

Mazanek, Jan: *See*—
Blahak, Johannes; Wagner, Kuno; Mazanek, Jan; and Haas, Peter, 4,133,943, Cl. 521-163.000.

McCormick, Richard E.; and Schneider, Alfred, to Omni Spectra, Inc. Alarm system responsive to the breaking of glass. 4,134,109, Cl. 340-550.000.

McDonald, David I.: *See*—
Kellermann, Arnold L.; and McDonald, David I., 4,133,625, Cl. 425-394.000.

McGann, Rodney, to Texaco Inc. Combined cycle electric power generating system with improvement. 4,133,567, Cl. 290-40.00R.

McGinniss, Vincent D.; and Stevenson, Donald R., to SCM Corporation. Coating process with compositions of active hydrogen compound, unsaturated or epoxy compound, and carbamothioate curing agent. 4,133,916, Cl. 427-195.000.

McGrath, John A.; and Robertson, Murray R., to Commonwealth Industrial Gases Limited, The. Infant incubator. 4,133,302, Cl. 128-1.00B.

McGraw-Edison Company: *See*—
Davies, David P., 4,133,559, Cl. 285-41.000.
Huber, William J., 4,134,094, Cl. 337-292.000.

McGuire, Hubert E.; and Draeger, William H., to Lear Siegler, Inc. Voice scrambler using syllabic masking. 4,133,977, Cl. 179-1.50M.

McGuire, John S.: *See*—
Nuzman, Carl E.; and McGuire, John S., 4,133,379, Cl. 166-234.000.

McKinley, William E.: *See*—
Hollander, Betty R.; and McKinley, William E., 4,133,700, Cl. 73-361.000.

McKinney, Joel D.: *See*—
Frayer, James A.; Lese, Henri K.; McKinney, Joel D.; Metzger, Kirk J.; and Paraskos, John A., 4,133,777, Cl. 252-465.000.

McLaen, Donald F.: *See*—
Chen, Tsang J.; and McLaen, Donald F., 4,133,687, Cl. 96-76.00R.

McLaren, Michael J. Device for managing keys and locks. 4,133,195, Cl. 70-456.00R.

McMahan, Forrest E.: *See*—
Jackson, Joseph E., 4,133,490, Cl. 241-101.600.

McManus, John W., to Copylite, Inc. Coin operated coin device for a copy machine. 4,133,420, Cl. 194-9.00T.

Mechlowitz, Bela: *See*—
Haas, Werner E. L.; Mechlowitz, Bela; and Adams, James E., 4,133,683, Cl. 96-1.0PS.

Meckl, Ferenc: *See*—
Dardai, Pal; Meckl, Ferenc; Papp, Jozsef; and Varga, Elemer, 4,134,034, Cl. 310-11.000.

Medina, Helene H.: *See*—
Medina, Joseph; and Medina, Helene H., 4,133,443, Cl. 220-18.000.

Medina, Joseph; and Medina, Helene H. Soap dish. 4,133,443, Cl. 220-18.000.

Melliger, Guido W., to Melliger, Guido W. Tablet coating apparatus with weight monitoring. 4,133,290, Cl. 118-7.000.

Melnik, Gary A.: *See*—
Lakomsky, Viktor I.; Grigorenko, Georgy M.; Torkhov, Gennady F.; Melnik, Gary A.; and Nesmikh, Vitaly S., 4,133,987, Cl. 219-121.00P.

Mercer, Albert. Waste evacuation attachment for recreational vehicles. 4,133,347, Cl. 137-344.000.

Mercier, Andre, to Fives-Cail Babcock. Screen for a basket of a centrifugal separator. 4,133,770, Cl. 210-497.0FB.

Merck & Co., Inc.: *See*—
Bolhofer, William A.; Cragoe, Edward J., Jr.; and Hoffman, Jacob M., Jr., 4,133,885, Cl. 424-256.000.

Merianos, John J.: *See*—
Kaplan, Saul; Merianos, John J.; Green, Harold A.; and Petrocci, Alfonso N., 4,133,772, Cl. 252-106.000.

Merkley, Joseph H.: *See*—
Malpass, Dennis B.; and Merkley, Joseph H., 4,133,824, Cl. 260-448.0AD.

Mermelstein, Robert: *See*—
Hellyer, James A.; Lambert, David S.; and Mermelstein, Robert, 4,133,779, Cl. 252-547.000.

Merrell Toraude et Compagnie: *See*—
Metcalf, Brian W.; and Jung, Michel, 4,133,964, Cl. 562-571.000.

Merz, Herbert; and Stockhaus, Klaus, to Boehringer Ingelheim GmbH. Analgesic and morphine antagonistic 2'-hydroxy-2-(5-isoxazolylmethyl)-6,7-benzomorphans and salts thereof. 4,133,888, Cl. 424-267.000.

Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See*—
Bschorr, Oskar; and Albrecht, Helmut, 4,133,157, Cl. 52-403.000.

Metallgesellschaft Aktiengesellschaft: *See*—
Jelinek, Horst; Elsenheimer, Gerd; and Klersy, Bernhard, 4,133,749, Cl. 209-24.000.

Metcalf, Brian W.; and Jung, Michel, to Merrell Toraude et Compagnie. α-Acetylenic derivatives of α-amino acids. 4,133,964, Cl. 562-571.000.

Mettoy Company Limited, The: *See*—
Chapman, Thomas M., 4,133,500, Cl. 244-153.00R.

Metzger, Kirk J.: *See*—
Frayer, James A.; Lese, Henri K.; McKinney, Joel D.; Metzger, Kirk J.; and Paraskos, John A., 4,133,777, Cl. 252-465.000.

Meulenberg, Andrew, Jr., to Communications Satellite Corporation. Shaped edge solar cell coverslide. 4,133,699, Cl. 136-89.0CC.

Meyer, Paul L., to Celanese Corporation. Butterfly valve assembly. 4,133,513, Cl. 251-306.000.

Meyer, Roth & Pastor Maschinenfabrik GmbH: *See*—
Ebel, Bruno; Krumholz, Gunter; and Rahn, Paul, 4,133,999, Cl. 219-51.000.

Mifsud, Joseph F.; and Bedenbender, John W., to Exxon Production Research Company. Vibrator hold-down plate. 4,133,409, Cl. 181-114.000.

Mikel, Merle E., to Fuel, Inc. Method and apparatus for enhancing fertilizing characteristics of irrigation water. 4,133,671, Cl. 71-54.000.

Milde, Helmut I., to High Voltage Engineering Corporation. Reduced power input for improved electrostatic precipitation systems. 4,133,649, Cl. 55-2.000.

Miles, James R., to Miles Lure Co., Inc. Fishing lure with double spinner. 4,133,135, Cl. 43-42.130.

Miles Laboratories, Inc.: *See*—
Flanyak, John R.; and Norton, Herbie R., 4,133,897, Cl. 426-250.000.

Miles Lure Co., Inc.: *See*—
Miles, James R., 4,133,135, Cl. 43-42.130.

Miller, Carl W.: *See*—
Simms, Douglas P.; White, Anthony F.; and Miller, Carl W., 4,133,918, Cl. 427-256.000.

Miller, Fay H.: *See*—
Palmer, Ray W.; and Miller, Fay H., 4,134,108, Cl. 340-539.000.

Miller, George E.; and Casey, William J. Replacement elevator call button assembly. 4,134,107, Cl. 340-381.000.

Miller, Gordon H., to Texaco Inc. Fibers coated with triozine polymers. 4,133,937, Cl. 428-392.000.

Miller, Irving F.; and Djordjevich, Ljubomir, to University of Illinois Foundation, The. Lipid encapsulated hemoglobin cells. 4,133,874, Cl. 424-38.000.

Miller, Robert B. High pressure duct clamp and method of use. 4,133,566, Cl. 285-350.000.

Miller, Robert G.: *See*—
Huxtable, James T.; Miller, Robert G.; and Robinson, Tommy E., 4,134,103, Cl. 340-146.1AB.

Mills, David: *See*—
Birch, Ivan J.; and Mills, David, 4,133,371, Cl. 164-350.000.

Minamikawa, Yoshio: *See*—
Kawasaki, Kenji; Miura, Shigeyoshi; Minamikawa, Yoshio; and Ohashi, Akira, 4,133,179, Cl. 405-263.000.

Minnesota Mining and Manufacturing Company: *See*—
Kohler, Gunter A.; and Anders, Leon W., 4,133,309, Cl. 128-146.600.

Minolta Camera Kabushiki Kaisha: *See*—
Arai, Kenichi, 4,133,609, Cl. 355-3.00R.
Tanaka, Harumi, 4,133,608, Cl. 354-235.000.

Mintz, Marcus, to Industrial Knitting, Inc. Split horn arrangement. 4,133,164, Cl. 53-261.000.

Miquel, Jean: *See*—
Cosyns, Jean; Chauvin, Yves; Juguin, Bernard; Le Page, Jean-Francois; and Miquel, Jean, 4,133,841, Cl. 260-676.00R.

Miskei, Mihaly: *See*—
Lakatos, Tamas; Miskei, Mihaly; Szolnoki, Janos; Toth, Ferenc; and Revesz, Laszlo, 4,133,866, Cl. 423-208.000.

Mitani, Satoru: *See*—
Kojima, Shigeru; Kojima, Kiyoshi; and Mitani, Satoru, 4,133,703, Cl. 148-31.570.

Mitchell, Clarence. Attitude insensitive valve. 4,133,345, Cl. 137-446.000.

Mitchell, David S.; and Sageman, David R., to Chevron Research Company. Retorting process. 4,133,739, Cl. 208-8.000.

Mitchell, Thomas O.; and Whitehurst, Darrell D., to Mobil Oil Corporation. Hydrocarbon hydrofining utilizing a catalyst containing a synthetic amorphous silica. 4,133,744, Cl. 208-213.000.

Mitchell, Thomas O.: *See*—
Farcasiu, Malvina; Mitchell, Thomas O.; and Whitehurst, Darrell Duayne, 4,133,646, Cl. 44-1.00R.

Mitsubishi Chemical Industries Ltd.: *See*—
Ashida, Kaneyoshi; Ohtani, Masaaki; Yokoyama, Takashi; and Ohkubo, Shoichi, 4,133,781, Cl. 521-154.000.
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,133,880, Cl. 424-244.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Akamatsu, Masahiko, 4,134,054, Cl. 318-685.000.
Watanabe, Eiki, 4,133,413, Cl. 187-29.00R.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Nakamura, Hirokazu; Ohinouye, Tsuneo; Hori, Kenji; Kiyota, Yuhiko; Nakagami, Tatsuro; Tsukamoto, Yutaka; and Akishino, Katsuo, 4,133,322, Cl. 123-75.00B.

Mitsubishi Kinzoku Kabushiki Kaisha: *See*—
Takeuchi, Yo; Morikawa, Masaki; Tanaka, Chuji; and Hiji, Tosiharu, 4,134,001, Cl. 219-137.00R.

Mitsubishi Plastics Industries Limited: *See*—
Seino, Koichi; Omura, Hiroshi; Hinuma, Takayuki; and Hirota, Jyuzo, 4,133,924, Cl. 428-164.000.

Mitsubishi Rayon Co., Ltd.: *See*—
Kato, Tetsuji, 4,133,861, Cl. 264-216.000.

Mitsubushi Denki Kabushiki Kaisha: *See*—
Akamatsu, Masahiko, 4,134,055, Cl. 318-696.000.
Mittendorf, Richard J.; and Morris, Raymond H., to Emerson Electric Co. Internal pipe cutter. 4,133,105, Cl. 30-103.000.
Mittleman, Herbert; and Pekkarinen, Michael O., to Baxter Travenol Laboratories, Inc. Injection site. 4,133,441, Cl. 215-247.000.
Mittleman, John, to United States of America, Navy. Roughness diagnostic tool. 4,133,204, Cl. 73-105.000.
Miura, Shigeyoshi: *See*—
Kawasaki, Kenji; Miura, Shigeyoshi; Minamikawa, Yoshio; and Ohashi, Akira, 4,133,179, Cl. 405-263.000.
Miyake, Akira: *See*—
Oshimura, Masakazu; Yokoyama, Kenichi; Hayashi, Yukihiro; and Miyake, Akira, 4,133,676, Cl. 75-0.5AA.
Mladek, Walter: *See*—
Hofmann, Karl; and Mladek, Walter, 4,133,321, Cl. 123-32.00R.
Mobil Oil Corporation: *See*—
Burress, George T., 4,133,750, Cl. 209-166.000.
Gough, Stanley T. D., 4,133,878, Cl. 424-225.000.
Mitchell, Thomas O.; and Whitehurst, Darrell D., 4,133,744, Cl. 208-213.000.
Ruehle, William H., 4,134,098, Cl. 340-7.00R.
Spencer, Arthur T., 4,133,909, Cl. 427-54.000.
Moed, Johannes A. R., to TRW, Inc. Data pulse register/sender for a TDM switching system. 4,133,980, Cl. 179-15.0BY.
Moisson-Franckhauser, Francois: *See*—
Berthet, Michel; Gillet, Roger; Marquet, Andre; and Moisson-Franckhauser, Francois, 4,134,037, Cl. 310-52.000.
Mojonnier Bros. Co.: *See*—
Ore, William C.; and Skoli, Sigmund P., 4,133,853, Cl. 261-140.00R.
Molins Limited: *See*—
Arthur, Hugh M.; and Harrington, Timothy C., 4,133,454, Cl. 222-56.000.
Mong, William K.: *See*—
Cannon, John G.; Scott, Daniel G.; and Mong, William K., 4,133,561, Cl. 285-68.000.
Monsanto Company: *See*—
Isaksen, Robert A.; Locke, Frederic J.; Smith, John L.; and Spitz, George T., 4,133,843, Cl. 260-850.000.
Joyce, Samuel F., III; Morgan, Albert W.; Touchette, Norman W.; and Vanderlinde, William, 4,133,823, Cl. 260-439.00R.
King, Christopher J. H., 4,133,729, Cl. 204-75.000.
Wagenknecht, John H.; and Laurin, Dean G., 4,133,726, Cl. 204-59.00R.
Moore, Arthur D., to Northern Telecom Limited. Electronic network for telephone set. 4,133,983, Cl. 179-81.00B.
Moore, Billie G.: *See*—
Harrison, George W.; and Moore, Billie G., 4,133,351, Cl. 138-97.000.
Moore, Bruce R.: *See*—
Moore, David R., 4,133,913, Cl. 427-140.000.
Moore Business Forms, Inc.: *See*—
Roy, David M., 4,133,520, Cl. 270-52.500.
Moore, David R., to Moore, Bruce R. Method for providing automobile dashboards and the like with a texturized finish. 4,133,913, Cl. 427-140.000.
Moore, Richard A.; Pizzini, Louis C.; and Patton, John T., Jr., to BASF Wyandotte Corporation. Polyurethane foams prepared from condensation products of amines, epihalohydrins and alkylene oxides. 4,133,780, Cl. 521-167.000.
Moore, Robert T., to Envirotech Corporation. Electrolytic titration apparatus. 4,133,733, Cl. 204-195.00T.
Moracchioli, Robert: *See*—
de Lallee, Jacques; Marie, Gerard; and Moracchioli, Robert, 4,133,377, Cl. 165-118.000.
Moret, Michel, to Les Produits Associes Lpa SA. Rinsing device for personal hygiene. 4,133,482, Cl. 239-101.000.
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Joyce, Samuel F., III; Morgan, Albert W.; Touchette, Norman W.; and Vanderlinde, William, 4,133,823, Cl. 260-439.00R.
Morgan, Barrie O., to Datotek, Inc. System for locally enciphering prime data. 4,133,974, Cl. 178-22.000.
Morgan, Barrie O.: *See*—
Branscome, Kenneth M.; Morgan, Barrie O.; and Carter, Merlon B., 4,133,973, Cl. 178-22.000.
Morgan, Howard W., Jr., to Filter Specialists, Inc. Liquid filter having self-retaining filter bag. 4,133,769, Cl. 210-455.000.
Morikawa, Masaki: *See*—
Takeuchi, Yo; Morikawa, Masaki; Tanaka, Chuji; and Hiji, Tosiharu, 4,134,001, Cl. 219-137.00R.
Morimatsu, Yasuo; Tanaka, Toshio; Okumura, Nobuya; and Horiuchi, Takeshi, to Teijin Limited. Process for the preparation of polyesters. 4,133,801, Cl. 528-75.00R.
Morris, Raymond H.: *See*—
Mittendorf, Richard J.; and Morris, Raymond H., 4,133,105, Cl. 30-103.000.
Morrison, Charles F. Vapor injector for fuel combustion system. 4,133,628, Cl. 431-4.000.
Morse, James H.: *See*—
Lerner, Moisey M.; and Morse, James H., 4,133,725, Cl. 204-58.000.
Moser, Robert, to Rieter Machine Works Limited. Weighing apparatus for continuously weighing a passing layer of fiber material in a metering device of a spinning preparatory machine. 4,133,455, Cl. 222-77.000.
Moss, Ernest K.: *See*—
Beale, John H.; and Moss, Ernest K., 4,133,931, Cl. 428-315.000.
Mossberg Hubbard a Division of Wanskuck Company: *See*—
Hosbein, Hugh W., 4,133,435, Cl. 214-1.00D.
Motoren-und Turbinen-Union Munchen GmbH: *See*—
Fehler, Adolf; Kappler, Gunter; Kirschey, Gunter; and Schmidt, Jost, 4,133,633, Cl. 431-352.000.
Motorola, Inc.: *See*—
Pace, Wilson D., 4,134,030, Cl. 307-309.000.
Motoyama, Kazuyasu, to Olympus Optical Company, Ltd. Tape recorder with cue/review switching. 4,134,145, Cl. 360-137.000.
Motz, Herbert: *See*—
Koester, Eberhard; Deigner, Paul; Falk, Roland; Uhl, Karl; Schaefer, Dieter; Mayer, Dieter; Motz, Herbert; and Felleisen, Peter, 4,133,911, Cl. 427-130.000.
Moulin, Norbert L., to Hughes Aircraft Company. Pressure sensitive seal for wire and interface sealing of individual contacts in and between electrical connectors. 4,133,593, Cl. 339-94.00R.
Moutou, Paul C.; and Godart, Jean-Jacques, to Thomson-CSF. Hyperfrequency device with gunn effect. 4,134,122, Cl. 357-3.000.
Mrazek, Josef: *See*—
Polak, Josef; Boubela, Lubomir, and Mrazek, Josef, 4,133,734, Cl. 204-195.00C.
MTA Geokemiai Kutatolaboratorium: *See*—
Lakatos, Tamas; Miskei, Mihaly; Szolnoki, Janos; Toth, Ferenc; and Revesz, Laszlo, 4,133,866, Cl. 423-208.000.
Mueller, Karl F., to Ciba-Geigy Corporation. Perfluoroalkyl monoesters of anhydride 2,3,4,5-tetrahydrofurantetracarboxylic acid. 4,133,820, Cl. 260-346.740.
Mueller, Robert L.: *See*—
United States of America, National Aeronautics and Space Administration; Mueller, Robert L.; and Yasui, Robert K., 4,133,697, Cl. 136-89.00P.
Muller, Gerd, to Jenaer Glaswerk Schott & Gen. Glass composition for passivating semiconductor surfaces. 4,133,690, Cl. 106-52.000.
Muller, Hans, to GRAPHA-Holding AG. Sheet material collating apparatus. 4,133,521, Cl. 270-55.000.
Murarka, Shyam P.: *See*—
Adams, Arthur C.; Capio, Cesar D.; Levinstein, Hyman J.; and Murarka, Shyam P., 4,134,125, Cl. 357-54.000.
Muratov, Valerian M.: *See*—
Vorobiev, Jury P.; Ivanov, Jury S.; Ioffe, Lazar O.; Karpacheva, Susanna M.; Kukurechenko, Irina S.; Muratov, Valerian M.; Serebryakov, Viktor P.; and Shiyanov, Viktor A., 4,133,714, Cl. 162-237.000.
Murphy, William O.: *See*—
Lloyd, Ronald; Murphy, William O.; Patchell, Albert G.; and Herbert, Peter J., 4,133,310, Cl. 128-156.000.
Musitano, Charles M.; and King, Robert B. Exhaust gas muffler for an internal combustion engine. 4,133,479, Cl. 237-12.30A.
Mussler, James M.: *See*—
Zitelli, William E.; and Mussler, James M., 4,133,615, Cl. 415-43.000.
Mutsuta, Akio: *See*—
Arai, Izumi; Yamada, Yasuteru; Mutsuta, Akio; and Kadota, Kenji, 4,133,756, Cl. 210-67.000.
Myers, Robert F., to Pfizer Inc. 4''-Deoxy-4''-carbamate and dithiocarbamate derivatives of oleandomycin and its esters. 4,133,950, Cl. 536-9.000.
Myhre, Kjell E. Method of making diaphragm of optimized stress and strain distribution. 4,133,100, Cl. 29-610.0SG.
Naarmann, Herbert: *See*—
Siegel, Hardo; and Naarmann, Herbert, 4,133,946, Cl. 526-282.000.
Nabisco, Inc.: *See*—
Wolffing, Ralph M.; Batten, Clifford J.; and Harris, Meade C., Jr., 4,133,899, Cl. 426-507.000.
Naevestad, Roy, to Wilputte Corporation. Traveling hood for coke oven emission control. 4,133,721, Cl. 202-263.000.
Nafziger, Ralph H.; Hundley, Gary L.; and Jordan, Ronald R., to United States of America, Interior. Two-stage electric arc - electroslag process and apparatus for continuous steelmaking. 4,133,967, Cl. 13-9.0ES.
Nagai, Yohei; and Okamoto, Shimaji, to Nippon Gakki Seizo Kabushiki Kaisha. Waveshape memory type electronic musical instrument. 4,133,242, Cl. 84-1.130.
Nagano, Hikoichi: *See*—
Hachiboshi, Makoto; Matsunami, Koichi; Nagano, Hikoichi; Ieki, Hiroshi; and Oko, Tsutomu, 4,133,802, Cl. 528-502.000.
Nagel, Ferenc: *See*—
Vida, Denes; Nagel, Ferenc; Oldal, Endre; and Ugrosdy, Laszlo, 4,134,039, Cl. 313-229.000.
Naglowsky, Michael. Picnic table. 4,133,272, Cl. 108-132.000.
Nakada, Akira: *See*—
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Ishii, Shigeki, 4,133,244, Cl. 84-1.260.
Nakagami, Tatsuro: *See*—
Nakamura, Hirokazu; Ohinouye, Tsuneo; Hori, Kenji; Kiyota, Yuhiko; Nakagami, Tatsuro; Tsukamoto, Yutaka; and Akishino, Katsuo, 4,133,322, Cl. 123-75.00B.
Nakagawa, Masaru; Saito, Yasuaki; and Okada, Hideaki, to Iijima Products M.F.G. Co., Ltd.; and Okada Shigyo Co., Ltd. Apparatus for determining an oxygen content. 4,133,736, Cl. 204-195.00P.
Nakajima, Masahiro: *See*—
Takano, Masaaki; and Nakajima, Masahiro, 4,133,857, Cl. 264-120.000.
Nakajima, Yasuo; Hayashi, Yoshimasa; and Yoshimura, Tooru, to Nissan Motor Company, Ltd. Multi-point spark ignition engine

provided with exhaust recirculation circuit. 4,133,330, Cl. 123-148.00C.
Nakamura, Akihisa: *See—*
Yagi, Toru; and Nakamura, Akihisa, 4,133,324, Cl. 123-117.00A.
Nakamura, Hirokazu; Ohinouye, Tsuneo; Hori, Kenji; Kiyota, Yuhiko; Nakagami, Tatsuro; Tsukamoto, Yutaka; and Akishino, Katsuo, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine. 4,133,322, Cl. 123-75.00B.
Nakamura, Takao: *See—*
Tarao, Ryohkichi; Kaku, Kanji; Hayashi, Masaki; Nakamura, Takao; Ohishi, Shigeo; and Yamano, Hajime, 4,133,755, Cl. 210-38.00B.
Nakano, Juichi, to Daikin Kogyo Co., Ltd. Vaporizing type oil burner. 4,133,632, Cl. 431-328.000.
Nakano, Yoshihira: *See—*
Hida, Katsuaki; Matsushima, Tadasu; Ishida, Yasuhiko; and Nakano, Yoshihira, 4,133,206, Cl. 73-133.00R.
Nara, Harry R.: *See—*
Wiltshire, Arthur J.; Nara, Harry R.; LeBreton, Edward T.; and Bliley, Ward L., 4,133,442, Cl. 220-5.00R.
Narukawa, Satoshi: *See—*
Ikeda, Hironosuke; Hara, Mitsunori; and Narukawa, Satoshi, 4,133,856, Cl. 264-63.000.
Naslund, Erik I., to Floss Aid Corporation. Needle with deformable eye. 4,133,339, Cl. 132-89.000.
National Research Development Corporation: *See—*
Hartnagel, Hans L.; Hannah, Stephen J.; and Bayraktaroglu, Burhan, 4,133,724, Cl. 204-38.00A.
Neave, James H.; and Boudry, Michael R., to U.S. Philips Corporation. Spectroscopy. 4,134,014, Cl. 250-310.000.
Nelsen, Marvin G.: *See—*
Schuessler, John C.; Nelsen, Marvin G.; and Tapp, David J., 4,134,090, Cl. 335-229.000.
Nelson, Cecil O. Glazing hold-down clamp for solar energy collectors. 4,133,159, Cl. 52-822.000.
Nelson, Walter R. Tamper-resistant flow control attachment for shower arm. 4,133,350, Cl. 138-44.000.
Nesmikh, Vitaly S.: *See—*
Lakomsky, Viktor I.; Grigorenko, Georgy M.; Torkhov, Gennady F.; Melnik, Gary A.; and Nesmikh, Vitaly S., 4,133,987, Cl. 219-121.00P.
Ness, Richard A. Traction device. 4,133,307, Cl. 128-75.000.
Niaura, Vitas: *See—*
Vorrier, Robert J.; and Niaura, Vitas, 4,133,926, Cl. 428-200.000.
Nicol, Klaus; and Hennig, Ewald M. C. Apparatus for the time-dependent measurement of physical quantities. 4,134,063, Cl. 324-61.00R.
Nies, George E.: *See—*
Crowe, John J.; Kun, Leslie C.; and Nies, George E., 4,133,227, Cl. 76-107.00R.
Nihon Technical Kabushiki Kaisha: *See—*
Ohashi, Tamaki, 4,134,142, Cl. 360-93.000.
Niimi, Koji; Kumaoka, Michiaki; and Yamada, Takashi, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument utilizing recursive algorithm. 4,133,241, Cl. 84-1.010.
Nippon Columbia Kabushikikaisha: *See—*
Nukui, Katsuyoshi, 4,133,494, Cl. 242-186.000.
Nippon Electric Co., Ltd.: *See—*
Shiki, Haruo, 4,134,069, Cl. 325-11.000.
Washio, Makoto; and Shimamura, Tadao, 4,134,075, Cl. 329-135.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Hiyoshi, Teruo; Nakada, Akira; Yamada, Shigeru; Ichikawa, Kiyoshi; and Ishii, Shigeki, 4,133,244, Cl. 84-1.260.
Nagai, Yohei; and Okamoto, Shimaji, 4,133,242, Cl. 84-1.130.
Niimi, Koji; Kumaoka, Michiaki; and Yamada, Takashi, 4,133,241, Cl. 84-1.010.
Nippon Telegraph & Telephone Public Corporation: *See—*
Washio, Makoto; and Shimamura, Tadao, 4,134,075, Cl. 329-135.000.
Nishikawa, Etsuo: *See—*
Takatori, Osho; Nishikawa, Etsuo; and Fukuyama, Yosinobu, 4,133,280, Cl. 112-262.000.
Nishikawa, Kikuo: *See—*
Ikeda, Yorifumi; and Nishikawa, Kikuo, 4,133,759, Cl. 210-104.000.
Nishimura, Hiromichi; and Ichimura, Masahiko, to Asahi Glass Company Ltd. Fluorocopolymer composition having improved transparency. 4,133,798, Cl. 260-45.70R.
Nissan Motor Company, Ltd.: *See—*
Inoue, Mitsumasa, 4,133,327, Cl. 123-122.0AC.
Katoh, Kazumasa, 4,133,175, Cl. 60-293.000.
Masaki, Kenji, 4,133,174, Cl. 60-285.000.
Nakajima, Yasuo; Hayashi, Yoshimasa; and Yoshimura, Tooru, 4,133,330, Cl. 123-148.00C.
Otsubo, Kizuku; Yoshimura, Tooru; and Ohnishi, Akihiro, 4,133,331, Cl. 123-148.00C.
Nissen, Axel; and Kaibel, Gerd, to BASF Aktiengesellschaft. Manufacture of acetals. 4,133,836, Cl. 568-596.000.
Nitschke, John S. Conveyor drive mechanism for a glass sheet manufacturing system. 4,133,667, Cl. 65-163.000.
Niwatukino, Tooru, to Asahi Kasei Kogyo Kabushiki Kaisha. Method for making clad metal sheets having at least one curved major surface. 4,133,471, Cl. 228-107.000.
Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., to Compagnie Francaise des Petroles; Etudes Petrolieres Marines; Ateliers et Chantiers de Bretagne-A.C.B.; Compagnie Maritime d'Expertises; Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines (Doris); and Societe Nationale Elf Aquitaine (Production). Apparatus for welding submerged pipe ends. 4,133,180, Cl. 405-170.000.
Noethe, Bjoern; and Saller, Helmut, to Siemens Aktiengesellschaft. Method of producing coated optical elements. 4,133,915, Cl. 427-160.000.
Nogami, Tomoyuki: *See—*
Ohta, Takaaki; and Nogami, Tomoyuki, 4,133,584, Cl. 303-24.00C.
Noller, Hans G. Method of determining extracellular antigens and antibodies. 4,133,873, Cl. 424-8.000.
Nolph, Karl D., to University of Missouri, The Curators of the. Peritoneal dialysis solution containing nitroprusside. 4,133,891, Cl. 424-295.000.
Nord, Russell H., to Norland Corporation. High sweep rate waveform display control for digital recording waveform devices. 4,134,149, Cl. 364-900.000.
Norddeutsche Affinerie: *See—*
Perkow, Werner; Hopp, Hans; Ingwersen, Walter; and C.F. Spiess & Sohn, 4,133,892, Cl. 424-300.000.
Norland Corporation: *See—*
Nord, Russell H., 4,134,149, Cl. 364-900.000.
Norris, Kenneth W.; Bunyard, Alan D.; and Marchant, Derek N., to Worcester Controls AG. Linear-rotary converter. 4,133,215, Cl. 74-89.000.
Northcutt, William. Security cover for trunk and roof mounted antenna. 4,134,121, Cl. 343-715.000.
Northern Telecom Limited: *See—*
Moore, Arthur D., 4,133,983, Cl. 179-81.00B.
Norton, Herbie R.: *See—*
Flanyak, John R.; and Norton, Herbie R., 4,133,897, Cl. 426-250.000.
Nosaka, Shozo; and Yamamoto, Masahiro, to Terumo Corporation. Pipetting apparatus for automatic analyzer. 4,133,642, Cl. 422-67.000.
Nudds, Derrick A., to N.V. Tools Limited. Aerosol detector and method. 4,134,111, Cl. 340-629.000.
Nudelman, Boris I.; Simma, Ilya Y.; Uvarova-Nistratova, Ida T.; Lisbaron, Vitaly I.; Kalantarov, Grigory I.; and Imangulov, Vakel K. Process for producing cement. 4,133,693, Cl. 106-100.000.
Nukui, Katsuyoshi, to Nippon Columbia Kabushikikaisha. Tape driving apparatus. 4,133,494, Cl. 242-186.000.
Nuttall, Herbert E., Jr.; and Sass, Allan S., to Occidental Petroleum Corporation. Counter-current process with a hydrodesulfurization of solid carbonaceous materials. 4,133,867, Cl. 423-244.000.
Nuver, Eric L. H., to Esquire, Inc. Lighting circuits. 4,134,043, Cl. 315-92.000.
Nuzman, Carl E.; and McGuire, John S. Foraminous screening device and method for making same. 4,133,379, Cl. 166-234.000.
N.V. Industrieele Handelscombinatie Holland: *See—*
Donkers, Jacobus M., 4,133,120, Cl. 37-69.000.
N.V. Tools Limited: *See—*
Nudds, Derrick A., 4,134,111, Cl. 340-629.000.
Occidental Oil Shale: *See—*
Burton, Robert S., III; Chambers, Carlon C.; and Hughes, Robert F., 4,133,380, Cl. 166-259.000.
French, Gordon B., 4,133,580, Cl. 299-2.000.
Occidental Oil Shale, Inc.: *See—*
Stewart, Robert D., 4,133,381, Cl. 166-261.000.
Occidental Petroleum Corporation: *See—*
Nuttall, Herbert E., Jr.; and Sass, Allan S., 4,133,867, Cl. 423-244.000.
O'Connell, Timothy R.; Edelstein, Henry R.; and Leach, George S., to Electronic Memories & Magnetics Corporation. Single sense line memory cell. 4,134,151, Cl. 365-189.000.
Odell, Raymond: *See—*
Lowe, Brian A.; and Odell, Raymond, 4,133,308, Cl. 128-145.00R.
Odom, Robert E.; and Lieder, Gaylerd M., to Bemis Company, Inc. Case opener and bottom sealer. 4,133,254, Cl. 93-53.0SD.
Oelrich, Lee D. Joist structure. 4,133,155, Cl. 52-372.000.
Oestmann, Eldon D.: *See—*
Allen, Royce D.; and Oestmann, Eldon D., 4,133,401, Cl. 180-9.500.
Ogawa, Yonekichi. Knockdown type filtering device. 4,133,760, Cl. 210-169.000.
Ohashi, Akira: *See—*
Kawasaki, Kenji; Miura, Shigeyoshi; Minamikawa, Yoshio; and Ohashi, Akira, 4,133,179, Cl. 405-263.000.
Ohashi, Tamaki, to Nihon Technical Kabushiki Kaisha. Cassette tape player. 4,134,142, Cl. 360-93.000.
Ohbora, Shinichiro, to Tokyo Shibaura Electric Co., Ltd. Toner residual amount detecting device. 4,133,453, Cl. 222-39.000.
Ohinouye, Tsuneo: *See—*
Nakamura, Hirokazu; Ohinouye, Tsuneo; Hori, Kenji; Kiyota, Yuhiko; Nakagami, Tatsuro; Tsukamoto, Yutaka; and Akishino, Katsuo, 4,133,322, Cl. 123-75.00B.
Ohishi, Shigeo: *See—*
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Ohkubo, Kazuo: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,133,880, Cl. 424-244.000.
Ohkubo, Shoichi: *See—*
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Ohnishi, Akihiro: *See—*
Otsubo, Kizuku; Yoshimura, Tooru; and Ohnishi, Akihiro, 4,133,331, Cl. 123-148.00C.

Ohnsorge, Horst, to Licentia Patent-Verwaltungs-G.m.b.H. SSMA Data transmission system. 4,134,071, Cl. 325-42.000.

Ohta, Takaaki; and Nogami, Tomoyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Brake fluid pressure control valve of a deceleration sensing type. 4,133,584, Cl. 303-24.00C.

Ohtani, Masaaki: *See*—
Ashida, Kaneyoshi; Ohtani, Masaaki; Yokoyama, Takashi; and Ohkubo, Shoichi, 4,133,781, Cl. 521-154.000.

Oisel, Andre J.: *See*—
Cardot, Claude R.; Droux, Jacques P.; and Oisel, Andre J., 4,134,138, Cl. 360-39.000.

Okada, Hideaki: *See*—
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Okada, Shigeru: *See*—
Arai, Takao; Okada, Shigeru; Tomatsuri, Kouichi; and Toeda, Hiroshi, 4,134,078, Cl. 330-254.000.

Okada Shigyo Co., Ltd.: *See*—
Nakagawa, Masaru; Saito, Yasuaki; and Okada, Hideaki, 4,133,736, Cl. 204-195.00P.

Okamoto, Shimaji: *See*—
Nagai, Yohei; and Okamoto, Shimaji, 4,133,242, Cl. 84-1.130.

Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, to Mitsubishi Chemical Industries Ltd.; and Okamoto, Shosuke. N^2-Substituted-L-arginine derivatives and the pharmaceutically acceptable acid addition salts thereof. 4,133,880, Cl. 424-244.000.

Oko, Tsutomu: *See*—
Hachiboshi, Makoto; Matsunami, Koichi; Nagano, Hikoichi; Ieki, Hiroshi; and Oko, Tsutomu, 4,133,802, Cl. 528-502.000.

Okumura, Nobuya: *See*—
Morimatsu, Yasuo; Tanaka, Toshio; Okumura, Nobuya; and Horiuchi, Takeshi, 4,133,801, Cl. 528-75.00R.

Oldal, Endre: *See*—
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Olin Corporation: *See*—
Andrew, Eugene A., 4,133,707, Cl. 149-28.000.
Gray, Thomas J., 4,133,778, Cl. 252-517.000.

Olympus Optical Company, Ltd.: *See*—
Motoyama, Kazuyasu, 4,134,145, Cl. 360-137.000.
Takasugi, Noboru; and Suzuki, Yoshiro, 4,133,292, Cl. 118-650.000.

Omega Engineering Inc.: *See*—
Hollander, Betty R.; and McKinley, William E., 4,133,700, Cl. 73-361.000.

Omni Spectra, Inc.: *See*—
McCormick, Richard E.; and Schneider, Alfred, 4,134,109, Cl. 340-550.000.

Omura, Hiroshi: *See*—
Seino, Koichi; Omura, Hiroshi; Hinuma, Takayuki; and Hirota, Jyuzo, 4,133,924, Cl. 428-164.000.

Ore, William C.; and Skoli, Sigmund P., to Mojonnier Bros. Co. Aerosol carbonator. 4,133,853, Cl. 261-140.00R.

Orihara, Eiki: *See*—
Hayakawa, Akifumi; Aiba, Akira; Orihara, Eiki; and Fukushima, Kiyoshi, 4,133,858, Cl. 264-54.000.

Orth, Gunther; Pietsch, Rudolf; and Grundler, Ewald, to Wolf-Gerate GmbH. Method of regenerating lawn surfaces. 4,133,274, Cl. 111-2.000.

Oshimura, Masakazu; Yokoyama, Kenichi; Hayashi, Yukihiro; and Miyake, Akira, to Hitachi Maxell, Ltd. Acicular ferromagnetic metal particles and method for preparation of the same. 4,133,676, Cl. 75-0.5AA.

Osrodek, Tadeusz: *See*—
Jasniewicz, Zbigniew; Knyszewski, Jan; Osrodek, Tadeusz; and Stefanski, Lech, 4,133,077, Cl. 17-48.000.

Ostrowsky, Efrem M., to Ethyl Products Company. Plastic container. 4,133,449, Cl. 220-339.000.

Oswald, Hendrikus J.: *See*—
Li, Hsin L.; Oswald, Hendrikus J.; and Liland, Alfred L., 4,133,087, Cl. 28-257.000.

Otani, Akira, to Sharp Kabushiki Kaisha. Cooking mode selector for continuously varying a mean output level of a magnetron in a microwave oven. 4,133,998, Cl. 219-10.55B.

Otey, Felix H.; and Westhoff, Richard P., to United States of America, Agriculture. Biodegradable film compositions prepared from starch and copolymers of ethylene and acrylic acid. 4,133,784, Cl. 260-17.4ST.

Otis Engineering Corporation: *See*—
Gano, John C., 4,133,378, Cl. 166-85.000.

Otsubo, Kizuku; Yoshimura, Tooru; and Ohnishi, Akihiro, to Nissan Motor Company, Ltd. Dual spark-plug ignition internal combustion engine with improved combustion chamber wall. 4,133,331, Cl. 123-148.00C.

Outboard Marine Corporation: *See*—
Prince, Anthony P., 4,133,223, Cl. 74-538.000.

Ovard, John C., to Ecodyne Corporation. Cooling tower splash bar fill assembly and method. 4,133,851, Cl. 261-111.000.

Owens-Illinois, Inc.: *See*—
Dube, George, 4,134,084, Cl. 331-94.50F.
Fein, Michael E.; Byrum, Bernard W., Jr.; and Ernsthausen, Roger E., 4,133,934, Cl. 428-336.000.
Kontz, Robert F., 4,133,627, Cl. 425-525.000.
Williams, David W., 4,133,568, Cl. 294-74.000.

Oy Wartsila AB: *See*—
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Oyama, Shigeaki: *See*—
Inaba, Seiuemon; Shimajiri, Tokiji; and Oyama, Shigeaki, 4,133,230, Cl. 82-28.00R.

P.R. Mallory & Co., Inc.: *See*—
Scott, Charles E.; and Small, James E., 4,134,027, Cl. 307-141.000.

PACCAR Inc.: *See*—
Dickey, Robert B., 4,133,185, Cl. 62-179.000.

Pace, Wilson D., to Motorola, Inc. Hall-effect integrated circuit switch. 4,134,030, Cl. 307-309.000.

Pachovsky, Roman A.: *See*—
Cram, Phillip J.; and Pachovsky, Roman A., 4,133,382, Cl. 166-263.000.

Packaging Industries, Inc.: *See*—
Gundal, Peter H., 4,133,260, Cl. 100-257.000.

Pahl, Karl-Heinz. Process for producing shaped parts from synthetic and device for accomplishing the process. 4,133,855, Cl. 264-40.100.

Palcher, Joseph J., to Very Important Products, Inc. Rubber and polymer preservative method. 4,133,921, Cl. 427-355.000.

Pall Corporation: *See*—
Cooper, Roydon B., 4,133,763, Cl. 210-232.000.

Palmer, Ray W.; and Miller, Fay H., to Res'Q, Inc. Emergency alarm device. 4,134,108, Cl. 340-539.000.

Panaro, Robert J., to Gould Inc. Electric fuse. 4,134,093, Cl. 337-252.000.

Papeteries de Belgique: *See*—
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Papp, Jozsef: *See*—
Dardai, Pal; Meckl, Ferenc; Papp, Jozsef; and Varga, Elemer, 4,134,034, Cl. 310-11.000.

Paraskos, John A.; and Smith, Edward W., to Gulf Research & Development Company. Process for increasing the fuel yield of coal liquefaction products by extraction of asphaltenes, resins and aromatic compounds from said coal liquefaction products. 4,133,740, Cl. 208-8.000.

Paraskos, John A.: *See*—
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Parker Manufacturing Company: *See*—
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Parlanti, Conrad A. Probe-type read-out thermometer. 4,133,208, Cl. 73-362.0SC.

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Maing, Il-Young; Parliment, Thomas H.; and Soukup, Robert J., 4,133,900, Cl. 426-540.000.

Parsons, Robert C. Method of making decorative panels. 4,133,919, Cl. 427-259.000.

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Chadha, Naresh K.; Partridge, John J., Jr.; and Uskokovic, Milan R., 4,133,818, Cl. 260-343.30P.

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Patchell, Albert G.: *See*—
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Patel, Bhupendra C., to Kendall Company, The. Hemostatic catheter and method. 4,133,303, Cl. 128-2.05S.

Patton, John T., Jr.: *See*—
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Pauwels, Michael A.: *See*—
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Pavack, Donald R.; and Sabo, Lawrence D. Grappling device with collapsible gripping arms. 4,133,569, Cl. 294-106.000.

Pearl, David R., to Gerber Garment Technology, Inc. Programmed method and apparatus for cutting sheet material with a sharpenable blade. 4,133,233, Cl. 83-56.000.

Pearl, David R., to Gerber Garment Technology, Inc. Sharpenable cutting blade with skew-cut notches for use in sheet material cutting apparatus. 4,133,236, Cl. 83-174.000.

Pearson, Donald E., to Pearson Research Corp. Process for preparing hydrocarbons from methanol and phosphorus pentoxide. 4,133,838, Cl. 260-666.00P.

Pearson Research Corp.: *See*—
Pearson, Donald E., 4,133,838, Cl. 260-666.00P.

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Pekkarinen, Michael O.: *See*—
Mittleman, Herbert; and Pekkarinen, Michael O., 4,133,441, Cl. 215-247.000.

Pelchat, Paul F.; and March, Anthony, to General Motors Corporation. Bi-directional electric motor control circuit. 4,134,051, Cl. 318-282.000.

Pelton, John F., to Union Carbide Corporation. Refuse pelletizer. 4,133,259, Cl. 100-43.000.

Penn Fishing Tackle Mfg. Co.: *See*—
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Pennwalt Corporation: *See*—
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van Adelsberg, Martin M., 4,133,137, Cl. 43-114.000.

Penrose, Roger. Set of tiles for covering a surface. 4,133,152, Cl. 52-105.000.

Pentlicki, Chester J., to Communications Satellite Corporation. Self-deployable solar cell panel. 4,133,501, Cl. 244-173.000.
Perkins, Frank E.: *See—*
Ruihley, Robert E.; Perkins, Frank E.; Arps, Robert W.; and Troder, Walter P., 4,133,245, Cl. 85-80.000.
Perkow, Werner; Hopp, Hans; Ingwersen, Walter; and C.F. Spiess & Sohn, to Norddeutsche Affinerie. Combating pests with di-[2-thioureido-(N-alkoxycarbonyl)-N-phenylureido]-compounds. 4,133,892, Cl. 424-300.000.
Perlin, Jordan: *See—*
Eckstein, Ernest; Helmle, Anton; Perlin, Jordan; and Spitalnik, Irving, 4,133,252, Cl. 93-35.00H.
Perraudin, Claude: *See—*
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Petersen, Gerald A. Key chain construction. 4,133,196, Cl. 70-457.000.
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Petsch, Egon: *See—*
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Phillips Petroleum Company: *See—*
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Phillips, Wayne R. Boat paddle. 4,133,285, Cl. 115-24.100.
Phillips, Welton E. Shell casing resizer. 4,133,248, Cl. 86-23.000.
Piazza, Matthew R., to Maso-Therm Corporation. Process and apparatus for making a plurality of building modules. 4,133,859, Cl. 264-71.000.
Picandet, Jean A.; and Baratin, Andre N., to Jeumont-Schneider. Subscriber's line equipment for a telephone exchange. 4,133,986, Cl. 179-170.0NC.
Pickard, John: *See—*
Fermi, Rudy; Pickard, John; Kocsis, Alex; Bratton, David; and Kasner, Gerald, 4,133,264, Cl. 101-415.100.
Pickens, Donald, to Allied Chemical Corporation. Process for preparing α- and β-hydroxy oximes. 4,133,834, Cl. 260-566.00A.
Pielkenrood, Jacob, to Pielkenrood-Vinitex B.V. Apparatus for bringing about particle growth in a flowing liquid suspension. 4,133,771, Cl. 210-513.000.
Pielkenrood-Vinitex B.V.: *See—*
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Pierce, William C., to Hammerblow Corporation, The. Self-closing trailer coupler. 4,133,553, Cl. 280-509.000.
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Pilant, Thomas M. Boat trailer convertible to tent shelter. 4,133,577, Cl. 296-23.00B.
Pillsbury Company, The: *See—*
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Pioneer Electronic Corporation: *See—*
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Piscetta, Armando. Safety device for obsolete cylinder firearms. 4,133,127, Cl. 42-66.000.
Pittaro, Richard J., to Krautkramer-Branson, Incorporated. Clock circuit for use in pulse-echo ultrasonic defect testing. 4,134,081, Cl. 331-1.00A.
Pizzini, Louis C.: *See—*
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Pizzuti, Everett V.; and Gaskill, David M., Jr., to Atlan-Tol Industries, Inc. Limited rotation instrument rebalance apparatus employing a wiper having vibration damping. 4,134,062, Cl. 324-125.000.
Place, Donald E., to Therm-O-Disc Incorporated. Temperature responsive valve. 4,133,478, Cl. 236-48.00R.
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Plocher, Werner; and Lauffer, Hans-Martin, to Maschinenfabrik Lauffer & Butscher. Apparatus for covering electronic components with plastic material. 4,133,621, Cl. 425-116.000.
Pneumo Corporation: *See—*
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Heintz, Richard P., 4,133,250, Cl. 91-363.00A.
Poage, Roy L.; and Jewell, Michael A., to DeKalb Ag Research, Inc. Visual display calculator. 4,133,476, Cl. 235-85.0FC.
Poe, Ronald L.: *See—*
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Poirier, Victor L., to Thermo Electron Corporation. Stroke volume limiter for collapsible wall blood pump system. 4,133,616, Cl. 417-384.000.
Polak, Josef; Boubela, Lubomir; and Mrazek, Josef, to Chemoprojekt, projektova. Portable sensor for measuring the corrosion endangering and electrochemical protection of a metal structure buried in an electrolyte in a current field. 4,133,734, Cl. 204-195.00C.
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Posgate, Edward S. Submerged settler for suspended solids. 4,133,761, Cl. 210-170.000.
Powell, Lloyd J., to International Telephone & Telegraph Corp. Socket contact. 4,133,599, Cl. 339-258.00R.
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PPG Industries, Inc.: *See—*
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Pretzer, Wayne R.; Kobylinski, Thaddeus P.; and Bozik, John E., to Gulf Research & Development Company. Selective formation of ethanol from methanol, hydrogen and carbon monoxide. 4,133,966, Cl. 568-902.000.
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Priddy, William S., Jr., deceased; and Priddy, Betty H., administratrix. Means for propelling a wheeled vehicle. 4,133,403, Cl. 180-65.00A.
Prince, Anthony P., to Outboard Marine Corporation. Single lever control. 4,133,223, Cl. 74-538.000.
Pritulsky, James, to AMP Incorporated. Double ended receptacle. 4,133,595, Cl. 339-95.00D.
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Pruett, Roy L.; and Walker, Wellington E., to Union Carbide Corporation. Manufacture of polyfunctional compounds. 4,133,776, Cl. 252-431.00N.
Purcell, William A., to Penn Fishing Tackle Mfg. Co. Fishing reel. 4,133,499, Cl. 242-217.000.
Pusa, Ilkka; and Hurskainen, Oiva, to Oy Wartsila AB. Method for producing a cylinder lock. 4,133,093, Cl. 29-434.000.
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Quin, Murray L., to Emerson Electric Co. System for electrical interconnection and switching of multiple lighting fixtures. 4,134,045, Cl. 315-324.000.
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della Porta, Paolo; and Rabusin, Elio, 4,134,041, Cl. 313-481.000.
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Ragle, Herbert U.; and DeMoss, Dean L., to Burroughs Corporation. Apparatus for driving and controlling a partitionable flexible disk pack. 4,134,143, Cl. 360-98.000.

Ragle, Herbert U.; and DeMoss, Dean L., to Burroughs Corporation. Cartridge for multi-disk pack. 4,134,144, Cl. 360-133.000.
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Fetzer, Richard W.; and Ramachandran, Kolar S., 4,133,901, Cl. 426-573.000.
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Rasmussen, Harry R.; Kimzey, Gene A.; and Hailey, Robert D., to Crest Industries, Inc. Key telephone system. 4,133,985, Cl. 179-99.000.
Ratter, Henry, to Imperial Chemical Industries Limited. Container liner. 4,133,451, Cl. 220-461.000.
Ravera, Pasquale, to Stars Stampaggio Resine Speciali S.p.A. Platform for the lifting and handling of goods. 4,133,270, Cl. 108-51.100.
Ray, Ranjan, to Allied Chemical Corporation. Iron-refractory metal-boron glassy alloys. 4,133,679, Cl. 75-123.00B.
Ray, Ranjan, to Allied Chemical Corporation. Nickel-refractory metal-boron glassy alloys. 4,133,681, Cl. 75-170.000.
Ray, Ranjan, to Allied Chemical Corporation. Cobalt-refractory metal-boron glassy alloys. 4,133,682, Cl. 75-170.000.
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Fernsler, Ronald E., 4,134,082, Cl. 331-20.000.
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Shaw, Joseph M.; and Zaininger, Karl H., 4,133,925, Cl. 428-195.000.
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Weimer, Paul K., 4,134,031, Cl. 307-311.000.
Re, Luciano; Brant, Alberto; and Bassignani, Luciano, to Snamprogetti, S.p.A. 4-Thioxo-2-azetidinones. 4,133,807, Cl. 260-239.00A.
Reaume, Leonard V., to Magna American Corporation. Tine arrangements for garden tillers. 4,133,390, Cl. 172-43.000.
Reddy, Junuthula N., to Bendix Corporation, The. Fast response temperature sensor. 4,134,095, Cl. 338-25.000.
Redman, Charles M., to United States of America, Army. Endless fiber interferometer rotary motion sensor. 4,133,612, Cl. 356-350.000.
Reidelbach, Willi; Renner, Hermann; and Klie, Wolfgang, to Daimler-Benz Aktiengesellschaft. Longitudinal bearer. 4,133,549, Cl. 280-784.000.
Rein, Wolf-Heider, to International Standard Electric Corporation. Method and arrangement for writing and reading bit sequences. 4,134,139, Cl. 360-44.000.
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Res'Q, Inc.: *See—*
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Reynaud, Denis A. L. M., to Roach, Thomas. Vane type pump with optional high rate of flow or high pressure characteristics. 4,133,617, Cl. 418-150.000.
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Rhodes, Jerry D.; and Ek, Roger B., to Spectrum Glass Company, Inc. Method and apparatus for making variegated glass in a continuous sheet. 4,133,666, Cl. 65-101.000.
Rhone-Poulenc Industries: *See—*
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Richardson Chemical Company: *See—*
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Richardson, Christopher K., to Plessey Handel und Investments AG. Transmitter/receivers. 4,134,068, Cl. 325-7.000.
Richardson Company, The: *See—*
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Richardson Manufacturing Company, Inc.: *See—*
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Richardson, Raymond W.; Burda, Robert E.; and Crumrine, John C., to Richardson Manufacturing Company, Inc. Folding flexible undercutter plow. 4,133,391, Cl. 172-311.000.
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Ricoh Company, Ltd.: *See—*
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Riddel, John W., to General Motors Corporation. Flow amplifier valve assembly. 4,133,408, Cl. 180-108.000.
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Riew, Changkiu K., to B. F. Goodrich Company, The. Amine-terminated liquid polymers and process for preparation thereof. 4,133,957, Cl. 544-357.000.
Riggs, Denton D.; and Wagner, Gene A., to Hughes Aircraft Company. Radar system having amplitude and phase modulation and demodulation circuits. 4,134,114, Cl. 343-17.20R.
Riley, Victor; Macnab, Ian; Timusk, John; and English, Edward, to University of Toronto, The Governing Council of the. Fiber reinforcing composites comprising portland cement having embedded therein precombined absorbent and reinforcing fibers. 4,133,928, Cl. 428-255.000.
Rineer, Arthur E. Constant-velocity universal joint. 4,133,189, Cl. 64-17.00R.
Ritchie, Donald D.: *See—*
Bultman, John D.; Ritchie, Donald D.; and Jurd, Leonard, 4,133,862, Cl. 422-28.000.
Rivetti, Stefano. Toilet set to be installed in a minimum size room. 4,133,057, Cl. 4-1.000.
Rivier, Jean E. F.: *See—*
Vale, Wylie W., Jr.; Rivier, Jean E. F.; and Brown, Marvin R., 4,133,782, Cl. 260-8.000.
Roach, Carl L. Butt hinge screw location marking template. 4,133,114, Cl. 33-197.000.
Roach, Gary A., to Roach Manufacturing Corporation. Accumulating conveyor. 4,133,425, Cl. 198-781.000.
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Roach, Gary A., 4,133,425, Cl. 198-781.000.
Roach, Thomas: *See—*
Reynaud, Denis A. L. M., 4,133,617, Cl. 418-150.000.
Robbins, Sammy L.; and Armour, Bobby D. Utility trailer. 4,133,572, Cl. 296-23.00R.
Robert Bosch GmbH: *See—*
Adler, Karl-Heinz, 4,133,323, Cl. 123-117.00R.
Bianchi, Valerio; and Latsch, Reinhard, 4,133,320, Cl. 123-32.0EA.
Hofmann, Karl; and Mladek, Walter, 4,133,321, Cl. 123-32.00R.
Kosak, Wolfgang; Werner, Peter; Gerber, Hans; and Hidveghy, Ivan, 4,134,038, Cl. 318-245.000.
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Carlson, Robert A.; Roberts, Robert L.; and Farkas, Daniel F., 4,133,898, Cl. 426-462.000.
Robertshaw Controls Company: *See—*
Stripling, Stephen J., 4,133,349, Cl. 137-882.000.
Robertson, George H.: *See—*
Wheeler, Ian R.; and Robertson, George H., 4,133,695, Cl. 106-288.00Q.
Robertson, Murray R.: *See—*
McGrath, John A.; and Robertson, Murray R., 4,133,302, Cl. 128-1.00B.
Robertson, Otis E.: *See—*
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Robin, Leon: *See—*
de Corlieu, Guy; Malard, Marcel; Reymond, Jean-Claude; and Robin, Leon, 4,134,008, Cl. 250-199.000.
Robinson, Eugene A.; and Setliff, Jerry L., to Texas Instruments Incorporated. Loran C receiver. 4,134,117, Cl. 343-103.000.
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Huxtable, James T.; Miller, Robert G.; and Robinson, Tommy E., 4,134,103, Cl. 340-146.1AB.
Rockwell International Corporation: *See—*
Eilenberg, Stanton L.; Feiner, Melvin; Shuford, Charles L.; and Triplett, David W., 4,133,376, Cl. 165-105.000.
Rogers, Elmer H., Jr., to Aluminum Company of America. Method for extracting heat from a chamber containing a molten salt. 4,133,727, Cl. 204-67.000.
Rogers, Noel A. Low cost, high efficiency radio frequency transformer. 4,134,091, Cl. 336-61.000.

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Rohm and Haas Company: *See*—
Lewis, Sheldon N.; and Haggard, Richard A., 4,133,793, Cl. 260-31.20R.

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Birch, Ivan J.; and Mills, David, 4,133,371, Cl. 164-350.000.

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Schubert, Hans-Joachim; Schunk, Eckart; and Rossbach, Horst, 4,134,148, Cl. 361-334.000.

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Rothlisberger, Kurt, to Teletype Corporation. Tape cassette drive including means for reducing tape transport start-up shock. 4,133,497, Cl. 242-200.000.

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Warnant, Julien; Marechal-Prost, Jacques; and Cosquer, Philippe, 4,133,826, Cl. 260-465.00D.

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Rowe, George A.: *See*—
Berman, Edward J.; and Rowe, George A., 4,133,315, Cl. 128-303.00R.

Roy, David M., to Moore Business Forms, Inc. Decollator. 4,133,520, Cl. 270-52.500.

Rozier, Paul; and Granson, Jean, to Delle-Alsthom S.A; and Unelec S.A. Cell of low-voltage feed and distribution cellular switchboard. 4,133,994, Cl. 200-307.000.

Ruehle, William H., to Mobil Oil Corporation. Multiple reflection suppression in marine seismic exploration with long source and detector arrays. 4,134,098, Cl. 340-7.00R.

Ruhl, Walter F.; and Yeager, Robert R., to Lambert Corporation. Hand-held power driven cultivator. 4,133,389, Cl. 172-41.000.

Ruihley, Robert E.; Perkins, Frank E.; Arps, Robert W.; and Troder, Walter P., to Allied Moulded Products, Inc. Fastening device. 4,133,245, Cl. 85-80.000.

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Larmit, Adrianus J. F., 4,133,353, Cl. 139-435.000.

Ruwe, Victor W.; and Graben, Thomas D., to United States of America, Army. Thick film deposition of microelectronic circuit. 4,133,910, Cl. 427-96.000.

Ruzicka, Otto J. System for supporting removable posts. 4,133,154, Cl. 52-298.000.

Ryan, Charles W.: *See*—
Blanchard, William B.; and Ryan, Charles W., 4,133,816, Cl. 260-340.700.

Ryan Ramp, Inc.: *See*—
Ryan, William J., 4,133,283, Cl. 114-230.000.

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della Porta, Paolo; and Rabusin, Elio, 4,134,041, Cl. 313-481.000.

S. A. Martin: *See*—
Berthelot, Daniel, 4,133,523, Cl. 271-182.000.

S. C. Johnson & Son, Inc.: *See*—
Balfanz, Robert W., 4,133,448, Cl. 220-306.000.

S & S Industries, Inc.: *See*—
Schwartz, Herbert L., 4,133,316, Cl. 128-476.000.

Sabes, Jean, to Societe Anonyme dite: J. Sabes & Cli. Connecting members for the ends of tubs of a scraper conveyor. 4,133,424, Cl. 198-735.000.

Sabo, Lawrence D.: *See*—
Pavack, Donald R.; and Sabo, Lawrence D., 4,133,569, Cl. 294-106.000.

Sack, Wieland H., to Schoeller, Felix, Jr. Photographic carrier material containing thermoplastic microspheres. 4,133,688, Cl. 96-87.00R.

Sageman, David R.: *See*—
Mitchell, David S.; and Sageman, David R., 4,133,739, Cl. 208-8.000.

Sahajpal, Ved K.; Sarver, Larry D.; and Deegan, Claude C., to Borg-Warner Corporation. Polymer latex which is cross-linked with a dialkyl tin diacrylate in the preparation of grafted copolymers. 4,133,788, Cl. 260-29.7UP.

Sainsbury, Clive R.: *See*—
Cops, Michael H.; and Sainsbury, Clive R., 4,133,326, Cl. 123-119.0EC.

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Kato, Mitsuharu; Kikuchi, Toru; and Saito, Takayuki, 4,133,965, Cl. 568-723.000.

Saito, Yasuaki: *See*—
Nakagawa, Masaru; Saito, Yasuaki; and Okada, Hideaki, 4,133,736, Cl. 204-195.00P.

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Vale, Wylie W., Jr.; Rivier, Jean E. F.; and Brown, Marvin R., 4,133,782, Cl. 260-8.000.

Saller, Helmut: *See*—
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Salter, Stephen H., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Energy in Her Britannic Majesty's Government of the. Apparatus for use in the extraction of energy from waves on water. 4,134,023, Cl. 290-42.000.

Salyers, John C.: *See*—
Liberman, Harvey W.; and Salyers, John C., 4,133,438, Cl. 214-310.000.

Sampsel, Kenneth E.: *See*—
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Sanada, Rentaro; and Kawada, Shigeo, to Honda Giken Kogyo Kabushiki Kaisha. Throttle grip locking device for motorcycles. 4,133,193, Cl. 70-183.000.

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Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,133,192, Cl. 68-5.00E.

Sando, Yoshikazu; and Ishidoshiro, Hiroshi, to Sando Iron Works Co., Ltd. Apparatus for the continuous liquid processing of cloth in a high pressure steamer. 4,133,192, Cl. 68-5.00E.

Sandoz, Oscar A.; and Hooey, Keith E., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Antenna test shield. 4,134,119, Cl. 343-703.000.

Sandrock, Gary D.: *See*—
Turillon, Pierre P.; and Sandrock, Gary D., 4,133,426, Cl. 206-0.700.

Sanfilippo, Anthony; and Sanfilippo, Evangelyne L. Portable circular power hand saw bench. 4,133,360, Cl. 144-286.00R.

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Sanfilippo, Anthony; and Sanfilippo, Evangelyne L., 4,133,360, Cl. 144-286.00R.

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Sanford Process Corporation: *See*—
Lerner, Moisey M.; and Morse, James H., 4,133,725, Cl. 204-58.000.

Sanyo Electric Co., Ltd.: *See*—
Fukui, Katsuo; and Inoue, Tomio, 4,134,056, Cl. 320-20.000.
Hayama, Hajime, 4,133,298, Cl. 126-271.000.
Ikeda, Hironosuke; Hara, Mitsunori; and Narukawa, Satoshi, 4,133,856, Cl. 264-63.000.

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Sarson, Charles R.; and Browne, Frederick S., to Dana Corporation. Quick connect tube coupling. 4,133,564, Cl. 285-321.000.

Sarstedt, Walter. Suction pipette. 4,133,211, Cl. 73-425.600.

Sarver, Larry D.: *See*—
Sahajpal, Ved K.; Sarver, Larry D.; and Deegan, Claude C., 4,133,788, Cl. 260-29.7UP.

Sasnett, Michael W.; and Whitaker, Angus H., to GTE Sylvania Incorporated. Method of reducing arcing in a gas transport laser. 4,134,083, Cl. 331-94.50G.

Sass, Allan S.: *See*—
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Satake, Toshihiko. Rice pearling apparatus with humidifier. 4,133,257, Cl. 99-518.000.

Satterwhite, Charles R. Method of strip mining with cable supported conveyor. 4,133,581, Cl. 299-7.000.

Sauer, Donald J.: *See*—
Kosonocky, Walter F.; and Sauer, Donald J., 4,134,028, Cl. 307-221.00D.

Saunders, Thomas K.: *See*—
Costello, Matthew J.; Saunders, Thomas K.; and DeLuca, Albert M., 4,134,136, Cl. 358-291.000.

Scamehorn, John F.: *See*—
Ziegenhain, William C.; Poe, Ronald L.; Bendig, Larry L.; and Scamehorn, John F., 4,133,871, Cl. 423-628.000.

Schack, John B. Spring assisted door construction. 4,133,074, Cl. 16-180.000.

Schadow, Klaus C., to United States of America, Navy. Ducted rockets. 4,133,173, Cl. 60-204.000.

Schaefer, Dieter: *See*—
Koester, Eberhard; Deigner, Paul; Falk, Roland; Uhl, Karl; Schaefer, Dieter; Mayer, Dieter; Motz, Herbert; and Felleisen, Peter, 4,133,911, Cl. 427-130.000.

Schaffer, Harry E., Jr.; and Fisher, C. Donald, to Koppers Company, Inc. Material separator. 4,133,748, Cl. 209-17.000.

Schantz, Spencer C. Vehicle speed controller. 4,133,407, Cl. 180-108.000.

Schenectady Chemicals, Inc.: *See*—
Laganis, Deno; and Begley, Paul M., 4,133,787, Cl. 260-29.20E.
Schering Corporation: *See*—
Sherlock, Margaret H., 4,133,887, Cl. 424-266.000.
Scherrer, Igor; and Hersberger, Pierre, to Ebauches S.A. Electronic circuit for a quartz crystal watch. 4,133,169, Cl. 58-23.00R.
Scheuermann, Horst; and Hoch, Helmut, to BASF Aktiengesellschaft. Manufacture of dimethylaminobenzenesulfonates. 4,133,828, Cl. 260-508.000.
Schewe, Richard A., to Barber-Colman Company. Self-threading tension compensator. 4,133,493, Cl. 242-154.000.
Schilling, Paul, to Heidelberger Druckmaschinen AG. Sheet-turning drum for printing machines convertible from printing on one side of a sheet to printing on both sides of a sheet and vice versa. 4,133,263, Cl. 101-409.000.
Schinzel, Erich, to Hoechst Aktiengesellschaft. Process for the preparation of sulfonated benzofuran derivatives. 4,133,953, Cl. 542-454.000.
Schlegel Corporation: *See*—
Swift, David J., Jr., 4,133,147, Cl. 51-400.000.
Schleicher, George W., to Vapor Corporation. Obstruction sensing edge for a bifolding door. 4,133,365, Cl. 160-118.000.
Schmidt-Dunker, Manfred; and Greb, Wolfgang, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Compositions for preparation of aqueous solutions of salts of lower valence ^{99} technetium. 4,133,872, Cl. 424-1.000.
Schmidt, Hans-Joachim: *See*—
Fernholz, Hans; Schmidt, Hans-Joachim; Wunder, Friedrich; and Roscher, Gunter, 4,133,962, Cl. 560-245.000.
Schmidt, Jost: *See*—
Fehler, Adolf; Kappler, Gunter; Kirschey, Gunter; and Schmidt, Jost, 4,133,633, Cl. 431-352.000.
Schmidt, Paul. Earth boring assembly with drag pipe. 4,133,395, Cl. 175-22.000.
Schmits, Heinz-Herbert: *See*—
Heinemann, Otto; Schmits, Heinz-Herbert; and Baldus, Heinz-Dieter, 4,133,488, Cl. 241-79.000.
Schneider, Alfred: *See*—
McCormick, Richard E.; and Schneider, Alfred, 4,134,109, Cl. 340-550.000.
Schneider, Joseph D., to General Electric Company. Control arrangementt for a wheel slip system. 4,134,048, Cl. 318-52.000.
Schoeller, Felix, Jr.: *See*—
Sack, Wieland H., 4,133,688, Cl. 96-87.00R.
Schofield, Richard W., to General Engineering Co. (Radcliffe) Limited, The. Cable making machines. 4,133,167, Cl. 57-12.000.
Scholer, Fred R.: *See*—
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Schouten, James J.: *See*—
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Schranz, Karl-Wilhelm: *See*—
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Schroeder, Manfred R.: *See*—
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Schubart, Rolf E. R., to Dorst-Keramikmaschinen-Bau Otto Dorst und Dipl.-Ing. Walter Schlegel. Press for pressing potlike articles from ceramic powder. 4,133,626, Cl. 425-405.00H.
Schubert, Hans-Joachim; Schunk, Eckart; and Rossbach, Horst, to Demag, A.G. Electrical control and service unit. 4,134,148, Cl. 361-334.000.
Schuessler, John C.; Nelsen, Marvin G.; and Tapp, David J., to Leach Corporation. Electromagnetic actuator for a relay. 4,134,090, Cl. 335-229.000.
Schuller, Walter, to Eberhard Hoeckle GmbH, Firma. Cardan drive shaft with telescoping shaft parts. 4,133,190, Cl. 64-23.700.
Schulthess, Hans, to a Keller & C. Aktiengesellschaft. Method for reinforcing the edge region of a plate formed of a porous material by means of a reinforcement agent. 4,133,920, Cl. 427-282.000.
Schultz, Ward E.: *See*—
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Schunk, Eckart: *See*—
Schubert, Hans-Joachim; Schunk, Eckart; and Rossbach, Horst, 4,134,148, Cl. 361-334.000.
Schurter, Rolf; and Rempfler, Hermann, to Ciba-Geigy Corporation. Pyridyloxy-phenoxy-alkanecarboxylic acid derivatives which are effective as herbicides and as agents regulating plant growth. 4,133,675, Cl. 71-94.000.
Schwartz, Herbert L., to S & S Industries, Inc. Brassiere frame. 4,133,316, Cl. 128-476.000.
Scientific Apparatus Limited: *See*—
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SCM Corporation: *See*—
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McGinniss, Vincent D.; and Stevenson, Donald R., 4,133,916, Cl. 427-195.000.
Scott, August R.: *See*—
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Scott, Charles E.; and Small, James E., to P.R. Mallory & Co., Inc. Control system capable of accommodating a plurality of momentary switching devices. 4,134,027, Cl. 307-141.000.
Scott, Daniel G.: *See*—
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Scott, Norman H., to UOP Inc. Vapor/liquid distributor for fixed-bed catalytic reaction chambers. 4,133,645, Cl. 422-220.000.
Seas di Grissino & C.S.a.S.: *See*—
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Sedley, Bruce S.; and Allenbaugh, Howard M., to Sedley, Bruce S. Magnetic key operated door lock. 4,133,194, Cl. 70-222.000.
Segil, Arthur W. Light reflecting and shielding modules for suspended ceilings and accessories therefor. 4,133,160, Cl. 52-645.000.
Seino, Koichi; Omura, Hiroshi; Hinuma, Takayuki; and Hirota, Jyuzo, to Mitsubishi Plastics Industries Limited. Heat shrinkable laminate film. 4,133,924, Cl. 428-164.000.
Sekine, Yoichi; Shimotsuma, Wataru; and Tsubusaki, Shigeru, to Matsushita Electric Industrial Co., Ltd. Electrosensitive recording sheet with support containing cuprous iodide particles. 4,133,933, Cl. 428-328.000.
Sekmakas, Kazys; Shah, Raj; and DeRossi, John F., to DeSoto, Inc. Air drying thermosetting aqueous epoxy-acrylic copolymer coating systems. 4,133,790, Cl. 260-29.6NR.
Selvi, Fabio, to Speizman Industries, Inc. Stocking toe end closing apparatus. 4,133,276, Cl. 112-121.150.
Semenyaka, Georgy D.: *See*—
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Setliff, Jerry L.: *See*—
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Shah, Raj: *See*—
Sekmakas, Kazys; Shah, Raj; and DeRossi, John F., 4,133,790, Cl. 260-29.6NR.
Shaheen, Virginia. Tent canopy supported by a plate and spring wound strand. 4,133,341, Cl. 135-1.00D.
Shannon, John M., to U.S. Philips Corporation. Improved high voltage Schottky barrier diode. 4,134,123, Cl. 357-15.000.
Sharp, Herbert J., to United States Steel Corporation. Method of moulding a reinforced thermoplastic article. 4,133,860, Cl. 264-528.000.
Sharp Kabushiki Kaisha: *See*—
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Shaw, Joseph M.; and Zaininger, Karl H., to RCA Corporation. Planar silicon-on-sapphire composite. 4,133,925, Cl. 428-195.000.
Shea, Christopher J., to Stanley Works, The. Oven latch assembly with improved high temperature locking sub-assembly. 4,133,337, Cl. 126-197.000.
Sheibley, Dean W., to United States of America, National Aeronautics and Space Administration. Formulated plastic separators for soluble electrode cells. 4,133,941, Cl. 429-33.000.
Sheine, Gerald. Control means for a vehicular tractor-trailer connection. 4,133,552, Cl. 280-446.00B.
Shell Oil Company: *See*—
Cowles, Christopher S., 4,134,097, Cl. 340-7.00R.
Hansen, David R.; and St. Clair, David J., 4,133,731, Cl. 204-159.170.
Himes, Glenn R., 4,133,795, Cl. 260-33.6AQ.
Kim, Leo, 4,133,869, Cl. 423-272.000.
Shen, Kelvin K.; and Belles, Wayne S., to United States Borax & Chemical Corporation. (Aminophenyl)morpholines and use thereof. 4,133,672, Cl. 71-88.000.
Shen, Kelvin K.; and Belles, Wayne S., to United States Borax & Chemical Corporation. (Aminophenyl)morpholines. 4,133,673, Cl. 71-88.000.
Sheng, Ming N.: *See*—
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Sherlock, Margaret H., to Schering Corporation. Trityl picolinic acid derivatives and their use as anti-acne agents. 4,133,887, Cl. 424-266.000.
Sherwood Medical Industries, Inc.: *See*—
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Shibazaki, Hiroji; Edagawa, Setsuji; Hasegawa, Hisashi; and Kondo, Satoshi, to Shiraishi Kogyo Kaisha, Ltd. Process for preparing precipitated calcium carbonate. 4,133,894, Cl. 423-432.000.
Shiga, Kazumasa, to Matsushita Electric Industrial Co., Ltd. Random access monostable memory cell having both static and dynamic operating modes. 4,134,150, Cl. 365-222.000.
Shiino, Kaoru: *See*—
Yamazaki, Tuneo; Shiino, Kaoru; Yamaguchi, Akira; and Kato, Toshihiro, 4,133,491, Cl. 242-56.900.
Shiki, Haruo, to Nippon Electric Co., Ltd. Single side band multiplex signal radio relay. 4,134,069, Cl. 325-11.000.
Shimajiri, Tokiji: *See*—
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Shimamura, Tadao: *See*—
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Shimotsuma, Wataru: *See*—
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Shin, Kyoung-Ho; and Hwang, Chong-Dai, to Shin, Kyoung-Ho. Vise with selectable jaw faces. 4,133,519, Cl. 269-247.000.

Shin Nippon Koki Co., Ltd.: *See—*
Hida, Katsuaki; Matsushima, Tadasu; Ishida, Yasuhiko; and Nakano, Yoshihira, 4,133,206, Cl. 73-133.00R.

Shingu, Tamotsu: *See—*
Hosoe, Kazuya; Asaeda, Tsuyoshi; Yokota, Hideo; and Shingu, Tamotsu, 4,133,606, Cl. 354-25.000.

Shipitsyn, Sergei Y.: *See—*
Babaskin, Jury Z.; Efimov, Viktor A.; Sokirko, Leonid A.; Rostovskaya, Leonora A.; Shipitsyn, Sergei Y.; Semenyaka, Georgy D.; and Lutsenko, Georgy G., 4,133,680, Cl. 75-129.000.

Shiraishi Kogyo Kaisha, Ltd.: *See—*
Shibazaki, Hiroji; Edagawa, Setsuji; Hasegawa, Hisashi; and Kondo, Satoshi, 4,133,894, Cl. 423-432.000.

Shiraishi, Nobuaki, to Yamaha Hatsudoki Kabushiki Kaisha. Snowmobile. 4,133,400, Cl. 180-5.00R.

Shirao, Shojiro, to Kabushiki Kaisha Komatsu Seisakusho. Transfer mechanism for forging machines. 4,133,199, Cl. 72-405.000.

Shiyanov, Viktor A.: *See—*
Vorobiev, Jury P.; Ivanov, Jury S.; Ioffe, Lazar O.; Karpacheva, Susanna M.; Kukurechenko, Irina S.; Muratov, Valerian M.; Serebryakov, Viktor P.; and Shiyanov, Viktor A., 4,133,714, Cl. 162-237.000.

Shoults, Royland D., to United States of America, Army. Propellants containing carboranylmethyl alkyl sulfide plasticizers. 4,133,706, Cl. 149-19.400.

Shuford, Charles L.: *See—*
Eilenberg, Stanton L.; Feiner, Melvin; Shuford, Charles L.; and Triplett, David W., 4,133,376, Cl. 165-105.000.

Shutt, George V. Fitting employing flexible plastic tubing with rolled back end. 4,133,565, Cl. 285-334.500.

Sibalis, Dan. Door activating motor control apparatus. 4,134,050, Cl. 318-267.000.

Sico Incorporated: *See—*
Carlson, Casey L., 4,133,271, Cl. 108-113.000.

Siegel, Hardo; and Naarmann, Herbert, to BASF Aktiengesellschaft. Optically active polymeric methylpinane derivatives containing ureido groups. 4,133,946, Cl. 526-282.000.

Siegfried Aktiengesellschaft: *See—*
Thiele, Kurt; and Bernhard, Heinz O., 4,133,903, Cl. 426-590.000.

Siegl, William F., to Xerox Corporation. Pivoting tray sorting apparatus. 4,133,522, Cl. 271-173.000.

Siemens Aktiengesellschaft: *See—*
Aulich, Hubert; Grabmaier, Josef; and Eisenrith, Karl-Heinz, 4,133,664, Cl. 65-3.00A.
Hoffmann, Kurt; and Mauthe, Manfred, 4,134,033, Cl. 307-362.000.
Krimmel, Eberhard, 4,133,702, Cl. 148-1.500.
Noethe, Bjoern; and Saller, Helmut, 4,133,915, Cl. 427-160.000.
Weinkauf, Burghard; and Luderer, Gunter, 4,134,018, Cl. 250-445.00T.

Simma, Ilya Y.: *See—*
Nudelman, Boris I.; Simma, Ilya Y.; Uvarova-Nistratova, Ida T.; Lisbaron, Vitaly I.; Kalantarov, Grigory I.; and Imangulov, Vakel K., 4,133,693, Cl. 106-100.000.

Simmons, Bobby G., to Dow Chemical Company, The. Apparatus for making foamed cleaning solutions and method of operation. 4,133,773, Cl. 252-359.00E.

Simms, Douglas P.; White, Anthony F.; and Miller, Carl W., to Computervision Corporation, The. Method of marking semiconductors. 4,133,918, Cl. 427-256.000.

Simone, A. A.: *See—*
Davis, H. R.; Long, R. H.; and Simone, A. A., 4,133,758, Cl. 210-83.000.

Simonis, Jurgen: *See—*
Popiolek, Franz M.; and Simonis, Jurgen, 4,133,258, Cl. 100-5.000.

Simplimatic Engineering Company: *See—*
Butt, William C., 4,133,253, Cl. 93-37.00R.

Skinner, Ronald W., to Air Products and Chemicals, Inc. Removing vinyl chloride from a vent gas stream. 4,133,663, Cl. 62-18.000.

Skoli, Sigmund P.: *See—*
Ore, William C.; and Skoli, Sigmund P., 4,133,853, Cl. 261-140.00R.

Slade, Edgar O., deceased (by Slade, Eva Young, administratrix), to Advance Wall Systems, Inc. System for assembling framed wall sections. 4,133,097, Cl. 29-564.800.

Slade, Eva Young, administratrix: *See—*
Slade, Edgar O., deceased, 4,133,097, Cl. 29-564.800.

Slagley, William E.; and Strangway, Peter K., to Inland Steel Company. Leak detecting apparatus. 4,133,373, Cl. 165-11.000.

Sloyan, Jerome J.; and Kuppek, Anton, to Automatic Motor Base Co. Invertable mount for motors. 4,133,508, Cl. 248-558.000.

Small, James E.: *See—*
Scott, Charles E.; and Small, James E., 4,134,027, Cl. 307-141.000.

Small, Robert C., to General Motors Corporation. Headlamp adjusting nut. 4,133,246, Cl. 85-80.000.

Smallbone, Allan H.; and Gurvich, Yury M., to Bausch & Lomb, Inc. X-ray analytical system. 4,134,012, Cl. 250-272.000.

Smart, Jay A., to Jay A. Smart Research, Ltd. Diagonal bracing for lead post of folding partition. 4,133,364, Cl. 160-84.00R.

Smejda, Richard K. Liquid feeding, patterning and blending system. 4,133,293, Cl. 118-411.000.

Smith, Alva T. Ventilated stove. 4,133,336, Cl. 126-21.00A.

Smith, Claude A.; and Williams, Donald L., to General Motors Corporation. Pressure vacuum relief valve. 4,133,346, Cl. 137-493.600.

Smith, Edward W.: *See—*
Paraskos, John A.; and Smith, Edward W., 4,133,740, Cl. 208-8.000.

Smith Engineering Company: *See—*
York, James A., 4,133,374, Cl. 165-82.000.

Smith, Gerald E. Scooter. 4,133,548, Cl. 280-87.04R.

Smith, Harry D., Jr.; Smith, Michael P.; and Schultz, Ward E., to Texaco Inc. Earth formation porosity log using measurement of fast neutron energy spectrum. 4,134,011, Cl. 250-264.000.

Smith, Helen A. Toy for animals. 4,133,296, Cl. 119-29.000.

Smith International, Inc.: *See—*
Still, Norman H., 4,133,398, Cl. 175-171.000.
Tschirky, John E., 4,133,396, Cl. 175-57.000.
Tschirky, John E., 4,133,397, Cl. 175-96.000.

Smith, John L.: *See—*
Isaksen, Robert A.; Locke, Frederic J.; Smith, John L.; and Spitz, George T., 4,133,843, Cl. 260-850.000.

Smith, Joseph. Wreath device. 4,133,922, Cl. 428-10.000.

Smith Kline & French Laboratories Limited: *See—*
Durant, Graham J.; and Ganellin, Charon R., 4,133,886, Cl. 424-263.000.

Smith, Michael P.: *See—*
Smith, Harry D., Jr.; Smith, Michael P.; and Schultz, Ward E., 4,134,011, Cl. 250-264.000.

Smith & Nephew Research Limited: *See—*
Lloyd, Ronald; Murphy, William O.; Patchell, Albert G.; and Herbert, Peter J., 4,133,310, Cl. 128-156.000.

Smith, Stanley N.: *See—*
MacArthur, Samuel E.; and Smith, Stanley N., 4,133,092, Cl. 29-417.000.

SmithKline Corporation: *See—*
Dunn, George L.; and Hoover, John R. E., 4,133,882, Cl. 424-246.000.
Hill, David T.; Lantos, Ivan; and Sutton, Blaine M., 4,133,952, Cl. 536-121.000.

Smiths Industries Limited: *See—*
Holtam, John R.; Ford, Donald J.; and Freeman, Roger A., 4,133,209, Cl. 73-387.000.

Smolinski, Ronald E. Rotary cam-actuated vane machine. 4,133,618, Cl. 418-258.000.

Snamprogetti, S.p.A.: *See—*
Re, Luciano; Brant, Alberto; and Bassignani, Luciano, 4,133,807, Cl. 260-239.00A.

Sneider, Vincent R. Expandable syringe. 4,133,313, Cl. 128-232.000.

Snethen, Thomas H., to United Business Equipment Corp. Filing system. 4,133,444, Cl. 220-22.400.

Snow, Philip B.: *See—*
Gerard, Henry M.; and Snow, Philip B., 4,134,087, Cl. 333-72.000.

Snyder, Irving F.: *See—*
Hanley, James O.; and Snyder, Irving F., 4,133,421, Cl. 194-57.000.

Societa Farmaceutici Italia S.p.A.: *See—*
Masi, Paolo; Suarato, Antonino; Giardino, Pietro; Bernardi, Luigi; and Arcamone, Federico, 4,133,877, Cl. 424-180.000.

Societa' Italiana Resine S.I.R. S.p.A.: *See—*
Stigliani, Giuseppe; Giudici, Alessandro; and Ferre, Franco, 4,133,945, Cl. 526-189.000.

Societe Anonyme de Telecommunications: *See—*
Koreicho, Wladimir; and Lamelot, Pierre M. L., 4,134,007, Cl. 250-199.000.

Societe Anonyme dite: J. Sabes & Cli: *See—*
Sabes, Jean, 4,133,424, Cl. 198-735.000.

Societe des Acieries de Paris et d'Outreau: *See—*
Guillaumin, Jean C., 4,133,268, Cl. 105-202.000.

Societe Intersub Developpement: *See—*
Stankoff, Alain, 4,134,059, Cl. 324-29.000.

Societe Nationale Elf Aquitaine (Production): *See—*
Chateau, Georges M., 4,133,182, Cl. 405-169.000.
Nobileau, Philippe C.; Dermy, Rene M.; and Fleury, Guy J., 4,133,180, Cl. 405-170.000.

Sokirko, Leonid A.: *See—*
Babaskin, Jury Z.; Efimov, Viktor A.; Sokirko, Leonid A.; Rostovskaya, Leonora A.; Shipitsyn, Sergei Y.; Semenyaka, Georgy D.; and Lutsenko, Georgy G., 4,133,680, Cl. 75-129.000.

Solar Reflective Film, Inc.: *See—*
Jenkins, Robert A., Sr., 4,133,366, Cl. 160-328.000.

Soltis, Charles W., to Filterlab Corporation a subsidiary of Masco Corporation. Air filtration assembly. 4,133,653, Cl. 55-126.000.

Somers, Peter J.: *See—*
Barker, Sidney A.; Somers, Peter J.; and Woodbury, Robin R., 4,133,696, Cl. 127-46.00A.

Sone, Kiyoshi; and Yoshihara, Ichiro, to Ricoh Company, Ltd. Mechanical switch circuit comprising contact conditioning means. 4,134,026, Cl. 307-137.000.

Sony Corporation: *See—*
Hagiwara, Yoshiaki, 4,133,099, Cl. 29-578.000.
Hirai, Jun, 4,134,126, Cl. 358-4.000.
Suzuki, Tadao; and Fukami, Takeshi, 4,134,076, Cl. 330-10.000.
Tachi, Katsuichi, 4,134,130, Cl. 358-147.000.

Soo Hoo, Wayne. Two wheel motorized vehicle side wheel outrigger assembly. 4,133,402, Cl. 180-30.000.

Sorkin, Jack L.: *See—*
Thomas, Daniel C.; and Sorkin, Jack L., 4,133,685, Cl. 96-68.000.

Soukup, Robert J.: *See—*
Maing, Il-Young; Parliment, Thomas H.; and Soukup, Robert J., 4,133,900, Cl. 426-540.000.

Spaeth, Edmund E.: *See—*
Bloom, William G.; Choksi, Pradip V.; and Spaeth, Edmund E., 4,133,314, Cl. 128-272.300.

Spangler, Arthur S., deceased (by Spangler, Barbara F., executrix), to

Calbiochem Behring Corp. Topical treatment of skin diseases. 4,133,893, Cl. 424-354.000.
Spangler, Barbara F., executrix: *See—*
Spangler, Arthur S., deceased, 4,133,893, Cl. 424-354.000.
Spannagel, Richard: *See—*
Dobler, Karl-Ulrich; and Spannagel, Richard, 4,133,504, Cl. 246-5.000.
Spectra-Physics, Inc.: *See—*
Bakalyar, Stephen R.; and Honganen, Ronald E., 4,133,767, Cl. 210-31.00C.
Spectrum Glass Company, Inc.: *See—*
Rhodes, Jerry D.; and Ek, Roger B., 4,133,666, Cl. 65-101.000.
Speiser, Robert C.: *See—*
Jacobs, Paul F.; Thourson, Thomas L.; and Speiser, Robert C., 4,134,137, Cl. 358-293.000.
Speizman Industries, Inc.: *See—*
Arthur, Ronald L.; and Rankin, Buddie A., 4,133,277, Cl. 112-121.150.
Selvi, Fabio, 4,133,276, Cl. 112-121.150.
Spencer, Arthur T., to Mobil Oil Corporation. Radiation curable aqueous coatings. 4,133,909, Cl. 427-54.000.
Spirig, Ernst. Apparatus for flux coating metal wick. 4,133,291, Cl. 118-50.000.
Spisak, Edward G. Wheel and trim assembly. 4,133,583, Cl. 301-37.0TP.
Spitalnik, Irving: *See—*
Eckstein, Ernest; Helmle, Anton; Perlin, Jordan; and Spitalnik, Irving, 4,133,252, Cl. 93-35.00H.
Spitz, George T.: *See—*
Isaksen, Robert A.; Locke, Frederic J.; Smith, John L.; and Spitz, George T., 4,133,843, Cl. 260-850.000.
Spitz, Russell W. Solenoid operated valves. 4,133,348, Cl. 137-625.650.
Sprague Devices, Inc.: *See—*
Jaske, Robert F., 4,133,071, Cl. 15-250.040.
Springfield, Billy J., to American Desk Manufacturing Co. Stadium, gymnasium or like chair. 4,133,579, Cl. 297-452.000.
Spry, Douglas O.: *See—*
Cooper, Robin D. G.; and Spry, Douglas O., 4,133,808, Cl. 260-239.00A.
Spulgis, Ivars S.: *See—*
Hoy, David R.; Hickey, Thomas N.; Spulgis, Ivars S.; and Parish, Harold C., 4,133,651, Cl. 55-75.000.
Stadler, Gary D. Alphanumeric display device with keyboard for use with photographic system. 4,134,105, Cl. 354-105.000.
Stafford, Donald C., to Chicago Bridge & Iron Company. Method of joining a tank and skirt support together. 4,133,094, Cl. 29-447.000.
Stahre, Hakan A. L.; and Glantz, Dane E. R., to Husqvarna AB. Method of treating trees and a machine for practicing the method. 4,133,358, Cl. 144-3.00D.
Stamicarbon, B.V.: *See—*
Wassen, Willem J.; and Zwart, Rudolf L., 4,133,810, Cl. 260-239.30A.
Standing, Charles N.; and Brandberg, Lawrence C., to Pillsbury Company, The. Food package including condiment container for heating food. 4,133,896, Cl. 426-107.000.
Stanford, George H. Down spouts provided with heating elements. 4,134,002, Cl. 219-213.000.
Stankoff, Alain, to Societe Intersub Developpement. Method and apparatus for measuring the corrosion current of an immersed structure provided with a cathodic protection device. 4,134,059, Cl. 324-29.000.
Stanley Works, The: *See—*
Hildebrandt, William J., 4,133,412, Cl. 182-154.000.
Shea, Christopher J., 4,133,337, Cl. 126-197.000.
Stanzel, Victor. Jet-propelled model airplane. 4,133,139, Cl. 46-249.000.
Stars Stampaggio Resine Speciali S.p.A.: *See—*
Ravera, Pasquale, 4,133,270, Cl. 108-51.100.
Stauffer Chemical Company: *See—*
Uhing, Eugene H.; and Via, Francis A., 4,133,830, Cl. 260-543.00P.
Steer, David C.; and Williams, Hugh L., to Imperial Chemical Industries Limited. Treatment of single cell protein. 4,133,904, Cl. 426-656.000.
Stefanski, Lech: *See—*
Jasniewicz, Zbigniew; Knyszewski, Jan; Osrodek, Tadeusz; and Stefanski, Lech, 4,133,077, Cl. 17-48.000.
Stein, Leonard A.: *See—*
Berard, Louis N.; Hollmann, Alfred G.; and Stein, Leonard A., 4,133,140, Cl. 49-49.000.
Steiner, Edward: *See—*
Marino, Joseph A.; Gray, Gary A.; and Steiner, Edward, 4,133,477, Cl. 235-304.000.
Steiner, Peter, to Foster Wheeler Energy Corporation. Adsorber for removing pollutants from gases having uniform adsorption capability. 4,133,660, Cl. 55-387.000.
Stellner, Klaus: *See—*
Batz, Hans-Georg; Linke, Hans-Ralf; Stellner, Klaus; and Weimann, Gunter, 4,133,949, Cl. 536-7.000.
Stengel, Joseph E. Wire screen with tensioning assembly. 4,133,751, Cl. 209-404.000.
Stephens, Ian: *See—*
Bevan, Alfred R.; and Stephens, Ian, 4,133,623, Cl. 425-133.100.
Sterling Drug Inc.: *See—*
Collins, Joseph C.; and Diana, Guy D., 4,133,959, Cl. 560-53.000.
Sterling, Vaughn C.: *See—*
Collins, Edward J.; and Sterling, Vaughn C., 4,133,631, Cl. 431-359.000.
Stetson, Earl W., to General Electric Company. Surge arrester gap assembly. 4,134,146, Cl. 361-130.000.
Steuer, Rudolf. Relaxation apparatus including mattress and pneumatic vibrating device. 4,133,305, Cl. 128-33.000.
Stevenson, Donald R.: *See—*
McGinniss, Vincent D.; and Stevenson, Donald R., 4,133,916, Cl. 427-195.000.
Stewart, Harold F.: *See—*
Herman, Bruce A.; and Stewart, Harold F., 4,133,212, Cl. 73-647.000.
Stewart, John A.; and Hynes, Roy G., to General Motors Corporation. Low tire pressure detector. 4,134,102, Cl. 340-58.000.
Stewart, Robert D., to Occidental Oil Shale, Inc. Contacting treated oil shale with carbon dioxide to inhibit leaching. 4,133,381, Cl. 166-261.000.
Stigliani, Giuseppe; Giudici, Alessandro; and Ferre, Franco, to Societa' Italiana Resine S.I.R. S.p.A. Process for the preparation of cyclized polydienes. 4,133,945, Cl. 526-189.000.
Still, Norman H., to Smith International, Inc. Collapsible spider for use in supporting casing during upward drilling operations. 4,133,398, Cl. 175-171.000.
Stockhaus, Klaus: *See—*
Merz, Herbert; and Stockhaus, Klaus, 4,133,888, Cl. 424-267.000.
Stockholm, Charles A. Multiple vial universal flange level assembly for flanged pipes and the like. 4,133,115, Cl. 33-371.000.
Strangway, Peter K.: *See—*
Slagley, William E.; and Strangway, Peter K., 4,133,373, Cl. 165-11.000.
Strateurop S.A.: *See—*
Casset, Jacques G., 4,133,133, Cl. 43-22.000.
Stripling, Stephen J., to Robertshaw Controls Company. Condition responsive by-pass valve construction and method of making the same. 4,133,349, Cl. 137-882.000.
Strnad, Ronald L., to General Motors Corporation. Air filter assembly. 4,133,661, Cl. 55-497.000.
Stroke, Frederick G., to PPG Industries, Inc. Submicron beta silicon carbide powder and sintered articles of high density prepared therefrom. 4,133,689, Cl. 106-44.000.
Strom, Johan P., to U.S. Philips Corporation. Device for spreading of chaff payloads for radar interference. 4,134,115, Cl. 343-18.00B.
Stroud, Henry J. F.; and Tart, Kenneth R., to British Gas Corporation. Production of substitute natural gas. 4,133,825, Cl. 260-449.00M.
Structural Fibers, Inc.: *See—*
Wiltshire, Arthur J.; Nara, Harry R.; LeBreton, Edward T.; and Bliley, Ward L., 4,133,442, Cl. 220-5.00R.
Stuart, Manfred, to Stuart Plastics Ltd. Refinishing of the surfaces of bodies of a thermoplastic. 4,133,912, Cl. 427-140.000.
Stuart Plastics Ltd.: *See—*
Stuart, Manfred, 4,133,912, Cl. 427-140.000.
Studinger, Ernst, to Carl Hasse & Wrede GmbH. Lathe turret. 4,133,232, Cl. 82-36.00A.
Stupica, Vekoslav A. Device for retrieving floating pollutants on surface water. 4,133,765, Cl. 210-242.00S.
Sturm, Elmar, to Ciba-Geigy Corporation. Pyrrolo- and pyrido-1,4-benzoxazin-3-(2H)-one derivatives as microbicides. 4,133,954, Cl. 544-101.000.
Suarato, Antonino: *See—*
Masi, Paolo; Suarato, Antonino; Giardino, Pietro; Bernardi, Luigi; and Arcamone, Federico, 4,133,877, Cl. 424-180.000.
Suarez, Tulio: *See—*
Jones, C. David; and Suarez, Tulio, 4,133,814, Cl. 260-326.55A.
Suehiro Seiko Co., Ltd.: *See—*
Kume, Takeshi, 4,133,587, Cl. 308-183.000.
Sumitomo Heavy Industries, Ltd.: *See—*
Arai, Izumi; Yamada, Yasuteru; Mutsuta, Akio; and Kadota, Kenji, 4,133,756, Cl. 210-67.000.
Sumitomo Metal Industries, Ltd.: *See—*
Arai, Izumi; Yamada, Yasuteru; Mutsuta, Akio; and Kadota, Kenji, 4,133,756, Cl. 210-67.000.
Sunbeam Corporation: *See—*
Beck, William P., 4,133,103, Cl. 30-43.000.
Sunshine, Nathan. Reaming tool. 4,133,069, Cl. 15-104.10R.
Superior Oil Company, The: *See—*
Weichman, Bernard E.; and Knight, John H., 4,133,741, Cl. 208-11.00R.
Sutton, Blaine M.: *See—*
Hill, David T.; Lantos, Ivan; and Sutton, Blaine M., 4,133,952, Cl. 536-121.000.
Suzuki, Tadao; and Fukami, Takeshi, to Sony Corporation. Pulse width modulated signal amplifier. 4,134,076, Cl. 330-10.000.
Suzuki, Takeo; Inoue, Ikutaro; Tamai, Hideo; and Aoki, Masatsugu, to Alps Electric Co., Ltd. Typing machine. 4,133,422, Cl. 400-154.500.
Suzuki, Tomoo: *See—*
Kurane, Ryuichiro; Suzuki, Tomoo; and Takahara, Yoshimasa, 4,133,752, Cl. 210-12.000.
Suzuki, Yoshiro: *See—*
Takasugi, Noboru; and Suzuki, Yoshiro, 4,133,292, Cl. 118-650.000.
Svenska Kram AB: *See—*
Hansson, Erik G., 4,133,085, Cl. 24-263.0SW.
Swenumson, Carrol J. Roll top garage. 4,133,148, Cl. 52-64.000.
Swift, David J., Jr., to Schlegel Corporation. Abrasive brushes and methods of making same. 4,133,147, Cl. 51-400.000.
SWS Silicones Corporation: *See—*
Bingham, Thomas G., 4,133,938, Cl. 428-447.000.

System Development Corporation: *See—*
Kelly, Ronald D.; and Cannon, William L., 4,134,077, Cl. 330-69.000.
Szaantay, Csaba; Rohaaly, Jaanos; and Jelinek, Istvaan, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. Process for producing benzo (a) quinolizine derivatives. 4,133,812, Cl. 546-96.000.
Szalai, Jozsef: *See—*
Magos, Gabor; and Szalai, Jozsef, 4,134,132, Cl. 358-240.000.
Szolnoki, Janos: *See—*
Lakatos, Tamas; Miskei, Mihaly; Szolnoki, Janos; Toth, Ferenc; and Revesz, Laszlo, 4,133,866, Cl. 423-208.000.
Tabelev, Vladislav D.; Puzrin, Leonid G.; Kaschenko, Vladimir M.; Beletsky, Vyacheslav A.; and Blanin, Valentin A. Method for brazing ferromagnetic materials. 4,133,473, Cl. 228-215.000.
Tachi, Katsuichi, to Sony Corporation. Method and apparatus of inserting an address signal in a video signal. 4,134,130, Cl. 358-147.000.
Takahara, Yoshimasa: *See—*
Kurane, Ryuichiro; Suzuki, Tomoo; and Takahara, Yoshimasa, 4,133,752, Cl. 210-12.000.
Takaichi, Peter L.; and Graybeal, Andrew W., to Atari, Inc. Game table for booth installation. 4,133,530, Cl. 273-85.00G.
Takaishi, Naotake: *See—*
Inamoto, Yoshiaki; Tsuchihashi, Kiyoshi; Takaishi, Naotake; and Fujikura, Yoshiaki, 4,133,840, Cl. 260-666.0PY.
Takano, Masaaki; and Nakajima, Masahiro, to Chisso Corporation. Method for producing a granular sorbic acid. 4,133,857, Cl. 264-120.000.
Takase, Yosio, to Matsushita Electric Works, Ltd. Limit switch. 4,133,991, Cl. 200-47.000.
Takasugi, Noboru; and Suzuki, Yoshiro, to Olympus Optical Company, Ltd. Wet-developing stationary electrode. 4,133,292, Cl. 118-650.000.
Takatori Machinery Works, Ltd.: *See—*
Takatori, Osho; Nishikawa, Etsuo; and Fukuyama, Yosinobu, 4,133,280, Cl. 112-262.000.
Takatori, Osho; Nishikawa, Etsuo; and Fukuyama, Yosinobu, to Takatori Machinery Works, Ltd. Automatic method and apparatus for closing a toe end of a hose utilizing a straight line stitch. 4,133,280, Cl. 112-262.000.
Takeda Chemical Industries, Ltd.: *See—*
Ikeda, Yorifumi; and Nishikawa, Kikuo, 4,133,759, Cl. 210-104.000.
Takedoi, Atushi: *See—*
Matsui, Goro; Toda, Koji; Takedoi, Atushi; and Horiishi, Nanao, 4,133,677, Cl. 75-0.5AA.
Takeuchi, Seiji; and Fujita, Kazunori, to Hitachi, Ltd. Method of ion exchange chromatography. 4,133,753, Cl. 260-112.50R.
Takeuchi, Yo; Morikawa, Masaki; Tanaka, Chuji; and Hiji, Tosiharu, to Mitsubishi Kinzoku Kabushiki Kaisha. Process for welding copper materials. 4,134,001, Cl. 219-137.00R.
Tamai, Hideo: *See—*
Suzuki, Takeo; Inoue, Ikutaro; Tamai, Hideo; and Aoki, Masatsugu, 4,133,422, Cl. 400-154.500.
Tamao, Yoshikuni: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,133,880, Cl. 424-244.000.
Tamura, Akihiko: *See—*
Tarumi, Noriyoshi; Tamura, Akihiko; and Kokiso, Masakazu, 4,133,684, Cl. 96-1.50R.
Tanaka, Chuji: *See—*
Takeuchi, Yo; Morikawa, Masaki; Tanaka, Chuji; and Hiji, Tosiharu, 4,134,001, Cl. 219-137.00R.
Tanaka, Harumi, to Minolta Camera Kabushiki Kaisha. Electromagnetic shutter release device. 4,133,608, Cl. 354-235.000.
Tanaka, Toshio: *See—*
Morimatsu, Yasuo; Tanaka, Toshio; Okumura, Nobuya; and Horiuchi, Takeshi, 4,133,801, Cl. 528-75.00R.
Tapp, David J.: *See—*
Schuessler, John C.; Nelsen, Marvin G.; and Tapp, David J., 4,134,090, Cl. 335-229.000.
Tarao, Ryohkichi; Kaku, Kanji; Hayashi, Masaki; Nakamura, Takao; Ohishi, Shigeo; and Yamano, Hajime, to Chisso Corporation. Agent for removing heavy metals. 4,133,755, Cl. 210-38.00B.
Tart, Kenneth R.: *See—*
Stroud, Henry J. F.; and Tart, Kenneth R., 4,133,825, Cl. 260-449.00M.
Tarumi, Noriyoshi; Tamura, Akihiko; and Kokiso, Masakazu, to Konishiroku Photo Industry Co., Ltd. Electrophotographic material with intermediate layer. 4,133,684, Cl. 96-1.50R.
Taubinger, Robert P. L. V.; and Rashbrook, Robert B., to Imperial Chemical Industries Limited. Polyester production. 4,133,800, Cl. 260-45.7PH.
Taylor, A. Allilee: *See—*
Clinton, Russell M.; Taylor, A. Allilee; and Brown, Jimmy W., 4,133,640, Cl. 23-230.0PC.
Taylor, Attalee S.: *See—*
Cobaugh, Robert F.; Dowling, Edward C.; and Taylor, Attalee S., 4,133,592, Cl. 339-17.00M.
Taylor, Glenn E. Railroad crosstie replacement machine. 4,133,266, Cl. 104-9.000.
Taylor, Glenn E. Retractable railroad wheel assembly for road vehicle. 4,133,269, Cl. 105-215.00C.
Taylor, Jack D., to Du Pont de Nemours, E. I., and Company. Product and process. 4,133,844, Cl. 260-857.00L.
Taylor, Robert B.: *See—*
Brewer, Richard J.; Grant, Peter M.; and Taylor, Robert B., 4,133,783, Cl. 260-15.000.
Team, Inc.: *See—*
Harrison, George W.; and Moore, Billie G., 4,133,351, Cl. 138-97.000.
Technigaz: *See—*
Kotcharian, Michel, 4,133,181, Cl. 405-159.000.
TED Bildplatten Aktiengesellschaft AEG-Telefunken-Teldec: *See—*
Joschko, Gunter; and Albrecht, Peter, 4,133,145, Cl. 51-295.000.
Tedeschi, Anthony: *See—*
Asbell, Walter E.; Benjamin, James M.; Tedeschi, Anthony; VanDerWielen, Michael P.; and Wiese, Larry L., 4,134,088, Cl. 335-51.000.
Teijin Limited: *See—*
Morimatsu, Yasuo; Tanaka, Toshio; Okumura, Nobuya; and Horiuchi, Takeshi, 4,133,801, Cl. 528-75.00R.
Teletype Corporation: *See—*
Rothlisberger, Kurt, 4,133,497, Cl. 242-200.000.
Temp-Rite, Inc.: *See—*
Abell, Irwin R., 4,133,367, Cl. 160-368.00R.
Teramura, Hiroichi; Yamazaki, Yasuhiro; and Wakahara, Yasushi, to Kokusai Denshin Denwa Kabushiki Kaisha. Method for interline-coding facsimile signal. 4,134,133, Cl. 358-261.000.
Terando, Norman H.: *See—*
Abdulla, Riaz F.; and Terando, Norman H., 4,133,956, Cl. 544-336.000.
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Watanabe, Koichi; and Terasaki, Ichiro, 4,133,083, Cl. 24-205.14A.
Terumo Corporation: *See—*
Nosaka, Shozo; and Yamamoto, Masahiro, 4,133,642, Cl. 422-67.000.
Tervidis, Edward. Mounting device for sprinkler head. 4,133,387, Cl. 169-51.000.
Texaco Canada Inc.: *See—*
Cram, Phillip J.; and Pachovsky, Roman A., 4,133,382, Cl. 166-263.000.
Texaco Development Corp.: *See—*
Klein, Howard P., 4,133,803, Cl. 528-340.000.
Texaco Inc.: *See—*
Allen, Joseph C.; and Porter, John W., 4,133,384, Cl. 166-272.000.
Kalfoglou, George, 4,133,385, Cl. 166-273.000.
Lankford, Frank L., Jr., 4,134,099, Cl. 340-15.5TS.
Mayer, Edward A., 4,133,355, Cl. 141-217.000.
McGann, Rodney, 4,133,567, Cl. 290-40.00R.
Miller, Gordon H., 4,133,937, Cl. 428-392.000.
Smith, Harry D., Jr.; Smith, Michael P.; and Schultz, Ward E., 4,134,011, Cl. 250-264.000.
Texas Alkyls, Inc.: *See—*
Malpass, Dennis B.; and Merkley, Joseph H., 4,133,824, Cl. 260-448.0AD.
Watson, Spencer C.; Malpass, Dennis B.; and Yeargin, G. Scott, 4,133,815, Cl. 260-340.600.
Texas Instruments Incorporated: *See—*
Brewer, Terry L., 4,133,907, Cl. 427-43.000.
Chiang, Shang-Yi; and Carbajal, Bernard G., 4,133,698, Cl. 136-89.0SJ.
Robinson, Eugene A.; and Setliff, Jerry L., 4,134,117, Cl. 343-103.000.
Tezuka, Tohru: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,133,880, Cl. 424-244.000.
Theriot, Joseph G. Flow choke filter for oil and gas wells. 4,133,768, Cl. 210-452.000.
Therm-O-Disc Incorporated: *See—*
Linton, Jonathan L., 4,133,286, Cl. 116-313.000.
Place, Donald E., 4,133,478, Cl. 236-48.00R.
Thermo Electron Corporation: *See—*
Poirier, Victor L., 4,133,616, Cl. 417-384.000.
Thermo-Seal, Inc.: *See—*
Albert, Kenneth J., 4,133,446, Cl. 220-90.400.
Theysen, Humphrey R.: *See—*
DiNicolantonio, Arthur R.; and Theysen, Humphrey R., 4,133,852, Cl. 261-114.0TC.
Thiele, Kurt; and Bernhard, Heinz O., to Siegfried Aktiengesellschaft. Process for preparing bitter beverages. 4,133,903, Cl. 426-590.000.
Thiele, Paul; and Bresch, Hans Ulrich, to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Wave guide connection. 4,134,086, Cl. 333-27.000.
Thomas, Daniel C.; and Sorkin, Jack L., to Richardson Chemical Company. Lithographic plate and photoresist having photosensitive layers of diazo and cinnamoylated polyvinyl alcohol materials. 4,133,685, Cl. 96-68.000.
Thompson, John A.: *See—*
Bernardelli, William J.; Caudill, Allison H.; and Thompson, John A., 4,133,610, Cl. 355-3.0CH.
Thompson, John T.: *See—*
Gillemot, George W., 4,133,102, Cl. 29-750.000.
Thomson-CSF: *See—*
de Corlieu, Guy; Malard, Marcel; Reymond, Jean-Claude; and Robin, Leon, 4,134,008, Cl. 250-199.000.
Le Guen, Benoit; and Jacques, Andre, 4,133,601, Cl. 350-96.210.
Moutou, Paul C.; and Godart, Jean-Jacques, 4,134,122, Cl. 357-3.000.
Thourson, Thomas L.: *See—*
Jacobs, Paul F.; Thourson, Thomas L.; and Speiser, Robert C., 4,134,137, Cl. 358-293.000.

Thuleen, Richard A., to Litton Systems, Inc. Dual feed, horizontally polarized microwave oven. 4,133,997, Cl. 219-10.55F.

Tillmanns, Gunter: *See—*
Kolloch, Hardy; Tillmanns, Karl-Friedrich; Tillmanns, Hans W.; and Tillmanns, Gunter, 4,133,362, Cl. 145-24.000.

Tillmanns, Hans W.: *See—*
Kolloch, Hardy; Tillmanns, Karl-Friedrich; Tillmanns, Hans W.; and Tillmanns, Gunter, 4,133,362, Cl. 145-24.000.

Tillmanns, Karl-Friedrich: *See—*
Kolloch, Hardy; Tillmanns, Karl-Friedrich; Tillmanns, Hans W.; and Tillmanns, Gunter, 4,133,362, Cl. 145-24.000.

Timusk, John: *See—*
Riley, Victor; Macnáb, Ian; Timusk, John; and English, Edward, 4,133,928, Cl. 428-255.000.

Ting, Raymond M. L., to H. H. Robertson Company. Non-composite impact-resistant structure. 4,133,158, Cl. 52-478.000.

Tirpak, Michael R.; Schouten, James J.; and Green, Charles E., to Richardson Company, The. Mineral-filled, high impact polyolefin molding compositions. 4,133,797, Cl. 260-42.460.

TMC Corporation: *See—*
Kubelka, Axel R., 4,133,119, Cl. 36-121.000.

Toda Kogyo Corp.: *See—*
Matsui, Goro; Toda, Koji; Takedoi, Atushi; and Horiishi, Nanao, 4,133,677, Cl. 75-0.5AA.

Toda, Koji: *See—*
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Toeda, Hiroshi: *See—*
Arai, Takao; Okada, Shigeru; Tomatsuri, Kouichi; and Toeda, Hiroshi, 4,134,078, Cl. 330-254.000.

Tokuno, Tomotoshi. Method for producing a fishing-rod. 4,133,708, Cl. 156-179.000.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Ohbora, Shinichiro, 4,133,453, Cl. 222-39.000.

Tomatsuri, Kouichi: *See—*
Arai, Takao; Okada, Shigeru; Tomatsuri, Kouichi; and Toeda, Hiroshi, 4,134,078, Cl. 330-254.000.

Tomoda, Masayasu; and Ueta, Yutaka, to Kaikin Kogyo Co., Ltd. Composite material made of rubber elastomer and polytetrafluoroethylene resin. 4,133,927, Cl. 428-215.000.

Tomy Kogyo Co., Inc.: *See—*
Kimura, Osamu, 4,133,278, Cl. 112-198.000.

Tone, Richard D. Flipper type arrow rest. 4,133,334, Cl. 124-41.00A.

Tonomura, Shinji: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,133,880, Cl. 424-244.000.

Torch, Joseph. Saw bit swage. 4,133,226, Cl. 76-56.000.

Torkhov, Gennady F.: *See—*
Lakomsky, Viktor I.; Grigorenko, Georgy M.; Torkhov, Gennady F.; Melnik, Gary A.; and Nesmikh, Vitaly S., 4,133,987, Cl. 219-121.00P.

Toro Company, The: *See—*
Hunter, Edwin J.; and Hunter, Richard E., 4,133,344, Cl. 137-344.000.

Torrington Company, The: *See—*
Benson, Carl F.; and Humphrey, Harold W., Jr., 4,133,332, Cl. 123-198.00F.

Torrington, Leslie A., to RCA Corporation. Record handling system for a video disc player. 4,133,540, Cl. 274-9.00B.

Toth, Ferenc: *See—*
Lakatos, Tamas; Miskei, Mihaly; Szolnoki, Janos; Toth, Ferenc; and Revesz, Laszlo, 4,133,866, Cl. 423-208.000.

Touchette, Norman W.: *See—*
Joyce, Samuel F., III; Morgan, Albert W.; Touchette, Norman W.; and Vanderlinde, William, 4,133,823, Cl. 260-439.00R.

Toyo Boseki Kabushiki Kaisha: *See—*
Hachiboshi, Makoto; Matsunami, Koichi; Nagano, Hikoichi; Ieki, Hiroshi; and Oko, Tsutomu, 4,133,802, Cl. 528-502.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Ishikawa, Masakazu; and Chuwman, Tsutomu, 4,133,560, Cl. 285-81.000.
Ohta, Takaaki; and Nogami, Tomoyuki, 4,133,584, Cl. 303-24.00C.

Trail, Melvin P., to Chromalloy American Corporation. Method and apparatus for fabricating pipe centralizer or the like. 4,133,470, Cl. 228-44.10R.

Trimble, John O., to Exxon Research & Engineering Co. Shielded anodes. 4,133,737, Cl. 204-197.000.

Triplett, David W.: *See—*
Eilenberg, Stanton L.; Feiner, Melvin; Shuford, Charles L.; and Triplett, David W., 4,133,376, Cl. 165-105.000.

Troder, Walter P.: *See—*
Ruihley, Robert E.; Perkins, Frank E.; Arps, Robert W.; and Troder, Walter P., 4,133,245, Cl. 85-80.000.

TRW, Inc.: *See—*
Clary, Harry E., 4,133,221, Cl. 74-498.000.
Helliwell, Bradley A.; and Baichtal, James R., 4,133,979, Cl. 179-15.0BY.
Moed, Johannes A. R., 4,133,980, Cl. 179-15.0BY.

Tschirky, John E., to Smith International, Inc. Drilling and casing landing apparatus and method. 4,133,396, Cl. 175-57.000.

Tschirky, John E., to Smith International, Inc. Drilling with multiple in-hole motors. 4,133,397, Cl. 175-96.000.

Tsubusaki, Shigeru: *See—*
Sekine, Yoichi; Shimotsuma, Wataru; and Tsubusaki, Shigeru, 4,133,933, Cl. 428-328.000.

Tsuchihashi, Kiyoshi: *See—*
Inamoto, Yoshiaki; Tsuchihashi, Kiyoshi; Takaishi, Naotake; and Fujikura, Yoshiaki, 4,133,840, Cl. 260-666.0PY.

Tsukamoto, Yutaka: *See—*
Nakamura, Hirokazu; Ohinouye, Tsuneo; Hori, Kenji; Kiyota, Yuhiko; Nakagami, Tatsuro; Tsukamoto, Yutaka; and Akishino, Katsuo, 4,133,322, Cl. 123-75.00B.

Turek, Timothy R. Overhead instrument console. 4,133,405, Cl. 180-90.000.

Turillon, Pierre P.; and Sandrock, Gary D., to International Nickel Company, Inc., The. Hydride container. 4,133,426, Cl. 206-0.700.

UBE Industries, Ltd.: *See—*
Masaki, Mitsuo; and Fuzimura, Susumu, 4,133,831, Cl. 260-544.00K.

Ueta, Yutaka: *See—*
Tomoda, Masayasu; and Ueta, Yutaka, 4,133,927, Cl. 428-215.000.

Ugrosdy, Laszlo: *See—*
Vida, Denes; Nagel, Ferenc; Oldal, Endre; and Ugrosdy, Laszlo, 4,134,039, Cl. 313-229.000.

Uhing, Eugene H.; and Via, Francis A., to Stauffer Chemical Company. Process for preparing alkyl or aryl thiophosphorus halides and mixed isomers thereof. 4,133,830, Cl. 260-543.00P.

Uhl, Karl: *See—*
Koester, Eberhard; Deigner, Paul; Falk, Roland; Uhl, Karl; Schaefer, Dieter; Mayer, Dieter; Motz, Herbert; and Felleisen, Peter, 4,133,911, Cl. 427-130.000.

Ulfhielm, Lennart A. U.: *See—*
Andersson, John N. J.; Karlen, Harry K. G.; and Ulfhielm, Lennart A. U., 4,133,972, Cl. 174-47.000.

Unelec S.A.: *See—*
Rozier, Paul; and Granson, Jean, 4,133,994, Cl. 200-307.000.

Unger, Heinrich B. Prefabricated wall form and production method therefor. 4,133,156, Cl. 52-383.000.

Unice Machine Company: *See—*
Ducasse, Joseph C. V.; and Bouvet, Jean, 4,133,375, Cl. 165-92.000.

Union Carbide Corporation: *See—*
Bullman, Allan R., 4,133,796, Cl. 260-37.0EP.
Crowe, John J.; Kun, Leslie C.; and Nies, George E., 4,133,227, Cl. 76-107.00R.
Kupcikevicius, Vytautas, 4,133,076, Cl. 17-41.000.
Pelton, John F., 4,133,259, Cl. 100-43.000.
Pruett, Roy L.; and Walker, Wellington E., 4,133,776, Cl. 252-431.00N.

Union Oil Company of California: *See—*
Young, Donald C., 4,133,668, Cl. 71-11.000.

Union Special Corporation: *See—*
Herzer, William P.; and Cullen, Robert E., 4,133,275, Cl. 112-121.120.

Uniroyal, Inc.: *See—*
Hunter, Byron A.; and Prager, Irwin A., 4,133,832, Cl. 260-554.000.

United Business Equipment Corp.: *See—*
Snethen, Thomas H., 4,133,444, Cl. 220-22.400.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Sandoz, Oscar A.; and Hooey, Keith E., 4,134,119, Cl. 343-703.000.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Energy in Her Britannic Majesty's Government of the: *See—*
Salter, Stephen H., 4,134,023, Cl. 290-42.000.

United States Borax & Chemical Corporation: *See—*
Shen, Kelvin K.; and Belles, Wayne S., 4,133,672, Cl. 71-88.000.
Shen, Kelvin K.; and Belles, Wayne S., 4,133,673, Cl. 71-88.000.

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Agriculture: *See—*
Carlson, Robert A.; Roberts, Robert L.; and Farkas, Daniel F., 4,133,898, Cl. 426-462.000.
Otey, Felix H.; and Westhoff, Richard P., 4,133,784, Cl. 260-17.4ST.
Army: *See—*
Funke, Maurice F., 4,134,100, Cl. 340-18.0LD.
Redman, Charles M., 4,133,612, Cl. 356-350.000.
Ruwe, Victor W.; and Graben, Thomas D., 4,133,910, Cl. 427-96.000.
Shoults, Royland D., 4,133,706, Cl. 149-19.400.
Energy: *See—*
Burke, Francis P., 4,133,647, Cl. 44-24.000.
Hendricks, Charles D., 4,133,854, Cl. 264-10.000.
Health, Education & Welfare: *See—*
Herman, Bruce A.; and Stewart, Harold F., 4,133,212, Cl. 73-647.000.
Interior: *See—*
Nafziger, Ralph H.; Hundley, Gary L.; and Jordan, Ronald R., 4,133,967, Cl. 13-9.0ES.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Mueller, Robert L.; and Yasui, Robert K. Solar array strip and a method for forming the same. 4,133,697, Cl. 136-89.00P.
National Aeronautics and Space Administration: *See—*
Sheibley, Dean W., 4,133,941, Cl. 429-33.000.
Navy: *See—*
Bultman, John D.; Ritchie, Donald D.; and Jurd, Leonard, 4,133,862, Cl. 422-28.000.
Dawson, Thomas J., 4,133,935, Cl. 428-379.000.
Early, William E.; and Linn, Michael G., 4,133,144, Cl. 51-294.000.

Mittleman, John, 4,133,204, Cl. 73-105.000.
Schadow, Klaus C., 4,133,173, Cl. 60-204.000.

U.S. Philips Corporation: *See*—
Andre, Elie, 4,133,705, Cl. 148-171.000.
Corbett, Brian D., 4,134,118, Cl. 343-112.00S.
Lux, Peter, 4,134,134, Cl. 358-280.000.
Neave, James H.; and Boudry, Michael R., 4,134,014, Cl. 250-310.000.
Shannon, John M., 4,134,123, Cl. 357-15.000.
Strom, Johan P., 4,134,115, Cl. 343-18.00B.
van Heemskerck Veeckens, Johan F. T., 4,134,042, Cl. 315-59.000.
Vreeswijk, Johannes C. A.; and Kruimink, Rudolf M., 4,133,630, Cl. 431-359.000.
Zonneveld, Frans W., 4,134,020, Cl. 250-445.00T.

United States Steel Corporation: *See*—
Sharp, Herbert J., 4,133,860, Cl. 264-528.000.

United Technologies Corporation: *See*—
Hayes, Douglas R., 4,133,368, Cl. 164-35.000.
Licht, Lazar, 4,133,585, Cl. 308-9.000.

University of Delaware: *See*—
Bolton, Ellis T.; and Dey, Noel D., 4,133,294, Cl. 119-4.000.

University of Illinois Foundation, The: *See*—
Miller, Irving F.; and Djordjevich, Ljubomir, 4,133,874, Cl. 424-38.000.

University of Minnesota, The Regents of the: *See*—
Johnson, Russell C.; and Bey, Russell F., 4,133,717, Cl. 195-100.000.
Marple, Virgil A., 4,133,202, Cl. 73-28.000.

University of Missouri, The Curators of the: *See*—
Nolph, Karl D., 4,133,891, Cl. 424-295.000.

University of Toronto, The Governing Council of the: *See*—
Riley, Victor; Macnab, Ian; Timusk, John; and English, Edward, 4,133,928, Cl. 428-255.000.

University of Washington, The Board of Regents of the: *See*—
Afromowitz, Martin A.; and Yee, Sinclair S., 4,133,735, Cl. 204-195.00G.

UOP Inc.: *See*—
Anderson, Mark C., 4,133,842, Cl. 260-683.300.
Hayes, John C., 4,133,839, Cl. 260-666.00A.
Scott, Norman H., 4,133,645, Cl. 422-220.000.

Urlwin-Smith, Philip L.: *See*—
Cartwright, David; and Urlwin-Smith, Philip L., 4,133,674, Cl. 71-93.000.

Ushitani, Fukuzo. Device for emergency braking and preventing an automobile from slipping sideways. 4,133,414, Cl. 188-5.000.

Uskokovic, Milan R.: *See*—
Chadha, Naresh K.; Partridge, John J., Jr.; and Uskokovic, Milan R., 4,133,818, Cl. 260-343.30P.

USM Corporation: *See*—
Hayakawa, Akifumi; Aiba, Akira; Orihara, Eiki; and Fukushima, Kiyoshi, 4,133,858, Cl. 264-54.000.
Peck, Sumner H., 4,133,932, Cl. 428-323.000.

Uvarova-Nistratova, Ida T.: *See*—
Nudelman, Boris I.; Simma, Ilya Y.; Uvarova-Nistratova, Ida T.; Lisbaron, Vitaly I.; Kalantarov, Grigory I.; and Imangulov, Vakel K., 4,133,693, Cl. 106-100.000.

Vale, Wylie W., Jr.; Rivier, Jean E. F.; and Brown, Marvin R., to Salk Institute for Biological Studies, The. Somatostatin analogs with dissociated biological activities. 4,133,782, Cl. 260-8.000.

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Gentile, Patrick J.; and Gentile, Joseph P., 4,133,216, Cl. 74-384.000.

van Adelsberg, Martin M., to Pennwalt Corporation. Insect trap. 4,133,137, Cl. 43-114.000.

Van Bilderbeek, Bernard H., to Vetco, Inc. Through the flowline selector. 4,133,418, Cl. 193-23.000.

Vanderlinde, William: *See*—
Joyce, Samuel F., III; Morgan, Albert W.; Touchette, Norman W.; and Vanderlinde, William, 4,133,823, Cl. 260-439.00R.

VanDerWielen, Michael P.: *See*—
Asbell, Walter E.; Benjamin, James M.; Tedeschi, Anthony; VanDerWielen, Michael P.; and Wiese, Larry L., 4,134,088, Cl. 335-51.000.

VanHandel, Gerald J.: *See*—
Anderson, Thomas L.; Rasmussen, Glenn A.; and VanHandel, Gerald J., 4,134,004, Cl. 219-387.000.

van Heemskerck Veeckens, Johan F. T., to U.S. Philips Corporation. Electric discharge lamp control circuit having a temperature dependent capacitor. 4,134,042, Cl. 315-59.000.

Vapor Corporation: *See*—
Schleicher, George W., 4,133,365, Cl. 160-118.000.

Varga, Elemer: *See*—
Dardai, Pal; Meckl, Ferenc; Papp, Jozsef; and Varga, Elemer, 4,134,034, Cl. 310-11.000.

Varian Associates, Inc.: *See*—
Ernst, Richard R., 4,134,058, Cl. 324-0.50A.

Varma, Ravi K., to E. R. Squibb & Sons, Inc. 13-Alkylthio (and arylthio)-11,17-epoxy-17-methyl-18-norandrostenes. 4,133,811, Cl. 260-239.55R.

VDO Adolf Schindling AG: *See*—
Allerdist, Heinz, 4,133,406, Cl. 180-105.00E.

Velsicol Chemical Corporation: *See*—
Albright, James A., 4,133,846, Cl. 260-928.000.

Venter, Elise M. M.: *See*—
Lourens, Gerhardus J.; Koekemoer, Johannes M.; and Venter, Elise M. M., 4,133,948, Cl. 536-1.000.

Ventura, John A.: *See*—
Lerner, Edward; and Ventura, John A., 4,133,354, Cl. 141-18.000.

Vercelot, Jean P., to Aerosol Inventions and Development S.A. AID SA. High-reliability valve. 4,133,461, Cl. 222-402.240.

Verheul, Cornelis A. M.: *See*—
Hammink, Willem C.; and Verheul, Cornelis A. M., 4,133,570, Cl. 294-110.00R.

Very Important Products, Inc.: *See*—
Palcher, Joseph J., 4,133,921, Cl. 427-355.000.

Vetco, Inc.: *See*—
Ahlstone, Arthur G., 4,133,557, Cl. 285-39.000.
Ahlstone, Arthur G., 4,133,558, Cl. 285-39.000.
Van Bilderbeek, Bernard H., 4,133,418, Cl. 193-23.000.

Via, Francis A.: *See*—
Uhing, Eugene H.; and Via, Francis A., 4,133,830, Cl. 260-543.00P.

Vida, Denes; Nagel, Ferenc; Oldal, Endre; and Ugrosdy, Laszlo, to Egyesult Izzolampa es Villamossagi Reszvenytarsasag. High-pressure gas discharge light source. 4,134,039, Cl. 313-229.000.

Vidal, Andre: *See*—
Boret, Roger; Bronner, Charles; Huin, Roland; and Vidal, Andre, 4,133,743, Cl. 208-64.000.

Villamos Berendezes es Keszulek Muvek: *See*—
Magos, Gabor; and Szalai, Jozsef, 4,134,132, Cl. 358-240.000.

Visceglia, Marco P.; and Lorenzo, Robert. Coil type filter. 4,133,762, Cl. 210-186.000.

Visman, Jan, to Canadian Patents & Development Limited. Method for processing raw coal. 4,133,747, Cl. 209-10.000.

Vogel, David Scott: *See*—
Vogel, Kurt A., 4,133,107, Cl. 30-266.000.

Vogel, Donald Eugene: *See*—
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Vogel, Kurt A., to Vogel, Donald Eugene; and Vogel, David Scott. Tool and method for making the same. 4,133,107, Cl. 30-266.000.

Vogel, Marcel J.; and Vogel, Siegfried F., to International Business Machines Corporation. Wafer indexing system using a grid pattern and coding and orientation marks in each grid cell. 4,134,066, Cl. 324-210.000.

Vogel, Siegfried F.: *See*—
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Vogt, B. Richard, to E. R. Squibb & Sons, Inc. 4H-S-Triazolo[4,3-2][1,5]benzodiazepin-5-ones. 4,133,809, Cl. 260-239.30T.

Volkswagenwerk Aktiengesellschaft: *See*—
Wenninger, Josef, 4,133,220, Cl. 74-492.000.

Vollmer, Erwin H.; and Vollmer, George J., to Vollmer of America Corporation. Cutting teeth for circular saw blades. 4,133,240, Cl. 83-848.000.

Vollmer, George J.: *See*—
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Vorobiev, Jury P.; Ivanov, Jury S.; Ioffe, Lazar O.; Karpacheva, Susanna M.; Kukurechenko, Irina S.; Muratov, Valerian M.; Serebryakov, Viktor P.; and Shiyanov, Viktor A. Reaction vessel with pulsating means for producing lignocellulose product from crushed vegetable raw materials. 4,133,714, Cl. 162-237.000.

Vorrier, Robert J.; and Niaura, Vitas, to American Hoechst Corporation. Laminated identification card having special interlaminar adhesive. 4,133,926, Cl. 428-200.000.

Vostovich, Joseph E., to General Electric Company. Heat resistant ethylene-propylene rubber and insulated conductor product thereof. 4,133,936, Cl. 428-389.000.

Vreeswijk, Johannes C. A.; and Kruimink, Rudolf M., to U.S. Philips Corporation. Combustion flashlight lamp. 4,133,630, Cl. 431-359.000.

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Wacker-Chemie GmbH: *See*—
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Wagener, Dietrich, to Didier Engineering GmbH. Process and apparatus for charging inclined chamber coke oven. 4,133,719, Cl. 201-40.000.

Wagenknecht, John H.; and Laurin, Dean G., to Monsanto Company. Electrolytic flow-cell apparatus and process for effecting sequential electrochemical reaction. 4,133,726, Cl. 204-59.00R.

Wagner, Eugene R.; Renzi, Alfred A.; and Allen, Bobbie J., to Dow Chemical Company, The. Hypolipidemic compositions and method employing derivatives of 4-(((1,3-benzodioxol-5-yl)methyl)amino)-benzoic acid. 4,133,890, Cl. 424-282.000.

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Wagner, Norbert, to Linde Aktiengesellschaft. Production of high pressure oxygen. 4,133,662, Cl. 62-13.000.

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Wanner, Vernon W.; and Germuska, Richard W., to Globe-Union Inc. Rotary switch. 4,133,990, Cl. 200-6.00B.
Warnant, Julien; Marechal-Prost, Jacques; and Cosquer, Philippe, to Roussel UCLAF. Novel inversion process. 4,133,826, Cl. 260-465.00D.
Wartenberg, Erwin W., to Cordotex SA. Method for forming a polyethylene layer on a substrate. 4,133,710, Cl. 156-244.270.
Washio, Makoto; and Shimamura, Tadao, to Nippon Telegraph & Telephone Public Corporation; and Nippon Electric Co., Ltd. Amplitude-and-phase demodulator comprising a quantization circuit. 4,134,075, Cl. 329-135.000.
Wassen, Willem J.; and Zwart, Rudolf L., to Stamicarbon, B.V. Process for the recovery of ϵ-caprolactam from a reaction mixture of ϵ-caprolactam and sulfuric acid. 4,133,810, Cl. 260-239.30A.
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Wild, John P. Monitoring commutated scanning radio beams. 4,134,116, Cl. 343-100.0AP.
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Wright, John T.; and Wolfe, Kevin A., to Champion International Corporation. Lightweight structural panel. 4,133,930, Cl. 428-315.000.
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Young, Donald C., to Union Oil Company of California. Multicomponent soil supplement. 4,133,668, Cl. 71-11.000.
Young, Raymond R., to Wilson Jones Company. Bound volume suitable for filing cabinet storage. 4,133,590, Cl. 312-183.000.
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Zebuhr, William H., to Energy Systems Corporation. Protective helmet with thermal liner. 4,133,055, Cl. 2-411.000.
Zetah, Richard H. Water ski tow rope retriever. 4,133,496, Cl. 242-86.50A.
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TO WHOM

PATENTS WERE ISSUED ON THE 9TH DAY OF JANUARY, 1979

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Deknatel Inc.: *See*—
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241 4,133,319

CLASS 132

89 4,133,339

CLASS 134

112 4,133,340

CLASS 135

1 D 4,133,341

CLASS 136

89 CC 4,133,699
89 P 4,133,697
89 SJ 4,133,698

CLASS 137

15 4,133,342
116.5 4,133,343
344 4,133,344
4,133,347
446 4,133,345
493.6 4,133,346
625.65 4,133,348
882 4,133,349

CLASS 138

44 4,133,350
97 4,133,351
146 4,133,352

CLASS 139

435 4,133,353

CLASS 141

1 4,133,281
18 4,133,354
217 4,133,355
316 4,133,356

CLASS 142

49 4,133,357

CLASS 144

3 D 4,133,358
193 R 4,133,359
286 R 4,133,360
323 4,133,361

CLASS 145

24 4,133,362

CLASS 148

1.5 4,133,701
4,133,702
4,133,704
31.57 4,133,703
171 4,133,705

CLASS 149

19.4 4,133,706
28 4,133,707

CLASS 156

179 4,133,708
197 4,133,709
244.27 4,133,710
353 4,133,711
512 4,133,712

CLASS 157

1.3	4,133,363

CLASS 160

84 R	4,133,364
118	4,133,365
328	4,133,366
368 R	4,133,367

CLASS 162

216	4,133,713
237	4,133,714
341	4,133,715

CLASS 164

35	4,133,368
46	4,133,369
309	4,133,370
350	4,133,371
404	4,133,372

CLASS 165

11	4,133,373
82	4,133,374
92	4,133,375
105	4,133,376
118	4,133,377

CLASS 166

85	4,133,378
234	4,133,379
259	4,133,380
261	4,133,381
263	4,133,382
270	4,133,383
272	4,133,384
273	4,133,385
285	4,133,386

CLASS 169

51	4,133,387

CLASS 171

16	4,133,388

CLASS 172

41	4,133,389
43	4,133,390
311	4,133,391
809	4,133,392

CLASS 173

64	4,133,393
139	4,133,394

CLASS 174

19	4,133,970
46	4,133,971
47	4,133,972

CLASS 175

22	4,133,395
57	4,133,396
96	4,133,397
171	4,133,398
384	4,133,399

CLASS 178

22	4,133,973
	4,133,974

CLASS 179

1 E	4,133,975
1 P	4,133,976
1.5 M	4,133,977
15 BS	4,133,978
	4,133,981
15 BY	4,133,979
	4,133,980
18 AH	4,133,982
81 B	4,133,983
99	4,133,985
107 E	4,133,984
170 NC	4,133,986

CLASS 180

5 R	4,133,400
9.5	4,133,401
30	4,133,402
54 A	4,133,547
65 A	4,133,403
79.1	4,133,404
90	4,133,405
105 E	4,133,406
108	4,133,407
	4,133,408
114	4,133,410

CLASS 181

	4,133,409

CLASS 182

2	4,133,411
154	4,133,412

CLASS 187

29 R	4,133,413

CLASS 188

5	4,133,414
285	4,133,415

CLASS 191

12.2 R	4,133,416

CLASS 192

58 B	4,133,417

CLASS 193

23	4,133,418

CLASS 194

1 B	4,133,419
9 T	4,133,420
57	4,133,421

CLASS 195

96	4,133,716
100	4,133,717

CLASS 198

339	4,133,423
735	4,133,424
781	4,133,425

CLASS 200

5 E	4,133,989
6 B	4,133,990
47	4,133,991
81 R	4,133,992
153 K	4,133,993
307	4,133,994

CLASS 201

6	4,133,718
40	4,133,719

CLASS 202

223	4,133,720
263	4,133,721

CLASS 204

1 T	4,133,722
15	4,133,723
38 A	4,133,724
58	4,133,725
59 R	4,133,726
67	4,133,727
68	4,133,728
75	4,133,729
98	4,133,730
159.17	4,133,731
195 C	4,133,734
195 G	4,133,732
	4,133,735
195 P	4,133,736
195 T	4,133,733
197	4,133,737
294	4,133,738

CLASS 206

0.7	4,133,426
317	4,133,427
427	4,133,428
465	4,133,429
497	4,133,430
532	4,133,431

CLASS 208

8	4,133,739
	4,133,740
11 R	4,133,741
	4,133,742
64	4,133,743
213	4,133,744
254 H	4,133,745

CLASS 209

1	4,133,746
10	4,133,747
17	4,133,748
24	4,133,749
166	4,133,750
404	4,133,751
565	4,133,098

CLASS 210

12	4,133,752
31 C	4,133,767
36	4,133,754
38 B	4,133,755
67	4,133,756
75	4,133,757
83	4,133,758
104	4,133,759
169	4,133,760
170	4,133,761
186	4,133,762
232	4,133,763
236	4,133,764
242 S	4,133,765
275	4,133,766
452	4,133,768
455	4,133,769
497 FB	4,133,770
513	4,133,771

CLASS 211

71	4,133,432
192	4,133,433

CLASS 213

61	4,133,434

CLASS 214

1 D	4,133,435
16.4 A	4,133,436
75 R	4,133,437
310	4,133,438
505	4,133,439
506	4,133,440

CLASS 215

247	4,133,441

CLASS 219

10.55 B	4,133,998
10.55 F	4,133,997
10.55 M	4,133,995
	4,133,996
51	4,133,999
69 C	4,134,000
121 P	4,133,987
	4,133,988
137 R	4,134,001
213	4,134,002
327	4,134,003
387	4,134,004
413	4,134,005

CLASS 220

5 R	4,133,442
18	4,133,443
22.4	4,133,444
23.4	4,133,445
90.4	4,133,446
258	4,133,447
306	4,133,448
339	4,133,449
411	4,133,450
461	4,133,451

CLASS 221

185	4,133,452

CLASS 222

39	4,133,453
56	4,133,454
77	4,133,455
146 HE	4,133,456
212	4,133,457
228	4,133,458
314	4,133,459
386	4,133,460
402.24	4,133,461
546	4,133,462

CLASS 223

83	4,133,463

CLASS 224

25 A	4,133,464
42.1 D	4,133,465
48 W	4,133,466
52	4,133,467

CLASS 227

126	4,133,468

CLASS 228

7	4,133,469
44.1 R	4,133,470
107	4,133,471
140	4,133,472
215	4,133,473

CLASS 229

23 R	4,133,474

CLASS 235

61 NV	4,134,006
85 FC	4,133,476
304	4,133,477

CLASS 236

48 R	4,133,478

CLASS 237

12.3 A	4,133,479

CLASS 238

14	4,133,480
	4,133,481

CLASS 239

101	4,133,482
118	4,133,483
214.25	4,133,484
399	4,133,485
499	4,133,486

CLASS 241

5	4,133,487
79	4,133,488
89	4,133,489
101.6	4,133,490

CLASS 242

56.9	4,133,491
66	4,133,495
86.5 A	4,133,496
150 R	4,133,492
154	4,133,493
186	4,133,494
200	4,133,497
201	4,133,498
217	4,133,499

CLASS 244

153 R	4,133,500
173	4,133,501
	4,133,502
188	4,133,503

CLASS 246

5	4,133,504
167 D	4,133,505
172	4,133,506

CLASS 248

225.2	4,133,507
313	4,133,509
558	4,133,508

CLASS 250

199	4,134,007
	4,134,008
205	4,134,009
213 VT	4,134,010
264	4,134,011
272	4,134,012
298	4,134,013
310	4,134,014
341	4,134,015
392	4,134,016
398	4,134,017
439 R	4,134,019
445 T	4,134,018
	4,134,020
567	4,134,021
577	4,134,022

CLASS 251

31	4,133,510
133	4,133,511
173	4,133,512
306	4,133,513

CLASS 252

62.1 D	4,133,774
106	4,133,772
300	4,133,775
359 E	4,133,773
431 N	4,133,776
465	4,133,777
517	4,133,778
547	4,133,779

CLASS 254

124	4,133,514

CLASS 260

8	4,133,782
15	4,133,783
17.4 ST	4,133,784
22 CB	4,133,785
	4,133,786
27 EV	4,133,789
29.2 E	4,133,787
29.6 NR	4,133,790
29.6 WA	4,133,791
29.7 UP	4,133,788
30.2	4,133,792
31.2 R	4,133,793
31.6	4,133,794
33.6 AQ	4,133,795
37 EP	4,133,796
42.46	4,133,797
45.7 PH	4,133,800
45.7 R	4,133,798
45.8 A	4,133,799
112 R	4,133,804
112.5 R	4,133,753
112.5 S	4,133,805
156	4,133,806
239 A	4,133,807
	4,133,808
239.3 A	4,133,810
239.3 T	4,133,809
239.55 R	4,133,811
307 A	4,133,813
326.55 A	4,133,814
340.6	4,133,815
340.7	4,133,816
340.9 P	4,133,817
343.3 P	4,133,818
345.3	4,133,819
346.74	4,133,820
396 N	4,133,821
409	4,133,822
439 R	4,133,823
448 AD	4,133,824
449 M	4,133,825
465 D	4,133,826
465.4	4,133,827
508	4,133,828
543 P	4,133,830
544 K	4,133,831
554	4,133,832
558 R	4,133,833
566 A	4,133,834
651 R	4,133,837
666 A	4,133,839
666 P	4,133,838
666 PY	4,133,840
676 R	4,133,841
683.3	4,133,842
850	4,133,843
857 L	4,133,844
880 B	4,133,845
928	4,133,846

CLASS 261

18 A	4,133,847
41 B	4,133,848
78 R	4,133,849
93	4,133,850
111	4,133,851
114 TC	4,133,852
140 R	4,133,853

CLASS 264

10	4,133,854
40.1	4,133,855
54	4,133,858
63	4,133,856
71	4,133,859
120	4,133,857
216	4,133,861
528	4,133,860

CLASS 266

120	4,133,515
200	4,133,517

CLASS 267

125	4,133,516

CLASS 269

91	4,133,518
247	4,133,519

CLASS 270

52.5	4,133,520
55	4,133,521

CLASS 271

173	4,133,522
182	4,133,523

CLASS 272

111	4,133,524

CLASS 273

1 E	4,133,525
1 R	4,133,526
63 D	4,133,527
65 EF	4,133,528
81 R	4,133,529
85 G	4,133,530
102 R	4,133,531
105.4	4,133,532
106 A	4,133,533
176 E	4,133,534
192	4,133,535
240	4,133,536
241	4,133,537
276	4,133,538

CLASS 274

1 L	4,133,539
9 B	4,133,540

CLASS 277

65	4,133,541
152	4,133,542

CLASS 279

1 D	4,133,544
1 K	4,133,543
83	4,133,545

CLASS 280

11.1 BT	4,133,546
87.04 R	4,133,548
210	4,133,550
221	4,133,551
446 B	4,133,552
509	4,133,553
689	4,133,554
709	4,133,555
744	4,133,556
784	4,133,549

CLASS 285

39	4,133,557
	4,133,558
41	4,133,559
68	4,133,561
81	4,133,560
187	4,133,562
231	4,133,563
321	4,133,564
334.5	4,133,565
350	4,133,566

CLASS 290

40 R	4,133,567
42	4,134,023
52	4,134,024

CLASS 294

74	4,133,568
106	4,133,569
110 R	4,133,570

CLASS 296

23 B	4,133,577
23 C	4,133,571
23 R	4,133,572
26	4,133,573
28 C	4,133,574
95 R	4,133,575
137 B	4,133,576

CLASS 297

370	4,133,578
452	4,133,579

CLASS 299

2	4,133,580
7	4,133,581
64	4,133,582

CLASS 301

37 TP	4,133,583

CLASS 303

24 C	4,133,584

CLASS 307

125	4,134,025
137	4,134,026
141	4,134,027
221 D	4,134,028
293	4,134,029
309	4,134,030
311	4,134,031
351	4,134,032
362	4,134,033

CLASS 308

9	4,133,585
23	4,133,586
183	4,133,587
201	4,133,588

CLASS 310

11	4,134,034
42	4,134,035
	4,134,036
52	4,134,037

CLASS 312

125	4,133,589
183	4,133,590

CLASS 313

229	4,134,039
271	4,134,040
481	4,134,041

CLASS 315

59	4,134,042
92	4,134,043
209 R	4,134,044
324	4,134,045
384	4,134,046
408	4,134,047

CLASS 318

52	4,134,048
245	4,134,038
267	4,134,050
282	4,134,051
	4,134,052
561	4,134,053
685	4,134,054
696	4,134,055
756	4,134,049

CLASS 320

20	4,134,056
61	4,134,057

CLASS 324

0.5 A	4,134,058
29	4,134,059
29.5	4,134,060
54	4,134,061
61 R	4,134,063
125	4,134,062
201	4,134,064
208	4,134,065
210	4,134,066
219	4,134,067

CLASS 325

7	4,134,068
11	4,134,069
15	4,134,070
42	4,134,071

CLASS 328

14	4,134,072
63	4,134,073
169	4,134,074

CLASS 329

135	4,134,075

CLASS 330

10	4,134,076
69	4,134,077
254	4,134,078
281	4,134,079
307	4,134,080

CLASS 331

1 A	4,134,081
20	4,134,082
94.5 F	4,134,084
94.5 G	4,134,083
116 R	4,134,085

CLASS 333

27	4,134,086
72	4,134,087

CLASS 335

51	4,134,088
225	4,134,089
229	4,134,090

CLASS 336

61	4,134,091

CLASS 337

252	4,134,093
292	4,134,094
298	4,134,092

CLASS 338

25	4,134,095
195	4,134,096

CLASS 339

14 L	4,133,591
17 M	4,133,592
94 R	4,133,593
95 D	4,133,594
	4,133,595
98	4,133,596
125 R	4,133,597
198 G	4,133,598
258 R	4,133,599

CLASS 340

7 R	4,134,097
	4,134,098
15.5 TS	4,134,099
18 LD	4,134,100
52 D	4,134,101
58	4,134,102
146.1 AB	4,134,103
347 SY	4,134,106
381	4,134,107
539	4,134,108
550	4,134,109
552	4,134,110
629	4,134,111
632	4,134,112
780	4,134,104

CLASS 343

5 CM	4,134,113
17.2 R	4,134,114
18 B	4,134,115
100 AP	4,134,116
103	4,134,117
112 S	4,134,118
703	4,134,119
715	4,134,120
	4,134,121

CLASS 350

3.72	4,133,600
96.21	4,133,601
132	4,133,602
248	4,133,603

CLASS 351

123	4,133,604

CLASS 353

21	4,133,605

CLASS 354

25	4,133,606
81	4,133,607
105	4,134,105
235	4,133,608

CLASS 355

3 CH	4,133,610
3 R	4,133,609

CLASS 356

350	4,133,612

CLASS 357

3	4,134,122
15	4,134,123
48	4,134,124
54	4,134,125

CLASS 358

4	4,134,126
16	4,134,127
22	4,134,128
55	4,134,129
147	4,134,130
149	4,134,131
240	4,134,132
261	4,134,133
280	4,134,134
	4,134,135
291	4,134,136
293	4,134,137

CLASS 360

39	4,134,138
44	4,134,139
67	4,134,140
90	4,134,141
93	4,134,142
98	4,134,143
133	4,134,144
137	4,134,145

CLASS 361

130	4,134,146
235	4,134,147
334	4,134,148

CLASS 364

900	4,134,149

CLASS 365

51	4,133,611
189	4,134,151
222	4,134,150

CLASS 400

154.5	4,133,422
616.3	4,133,613

CLASS 401

206	4,133,614

CLASS 405

159	4,133,181
169	4,133,182
170	4,133,180
263	4,133,179

CLASS 415

43	4,133,615

CLASS 417

384	4,133,616

CLASS 418

150	4,133,617
258	4,133,618

CLASS 422

28	4,133,862
32	4,133,638
67	4,133,642
78	4,133,641
99	4,133,863
138	4,133,644
182	4,133,643
220	4,133,645

CLASS 423

85	4,133,864
106	4,133,865
208	4,133,866
244	4,133,867
272	4,133,869
365	4,133,868
388	4,133,870
432	4,133,894
628	4,133,871

CLASS 424

1	4,133,872
8	4,133,873
38	4,133,874
93	4,133,875
121	4,133,876
180	4,133,877
225	4,133,878
229	4,133,879
244	4,133,880
	4,133,881
246	4,133,882
248.52	4,133,883
250	4,133,884
256	4,133,885
263	4,133,886
266	4,133,887
267	4,133,888
269	4,133,889
282	4,133,890
295	4,133,891
300	4,133,892
354	4,133,893

CLASS 425

64	4,133,619
72 S	4,133,620
116	4,133,621
129 R	4,133,622
133.1	4,133,623
275	4,133,624
394	4,133,625
405 H	4,133,626
525	4,133,627

CLASS 426

33	4,133,895
107	4,133,896
250	4,133,897
462	4,133,898
507	4,133,899
540	4,133,900
573	4,133,901
582	4,133,902
590	4,133,903
656	4,133,904
660	4,133,905

CLASS 427

17	4,133,906
43	4,133,907
53	4,133,908
54	4,133,909
96	4,133,910
130	4,133,911
140	4,133,912
	4,133,913
160	4,133,914
	4,133,915
195	4,133,916
209	4,133,917
256	4,133,918
259	4,133,919
282	4,133,920
355	4,133,921

CLASS 428

10	4,133,922
35	4,133,923
164	4,133,924
195	4,133,925
200	4,133,926
215	4,133,927
255	4,133,928
260	4,133,929
315	4,133,930
	4,133,931
323	4,133,932
328	4,133,933
336	4,133,934
379	4,133,935
389	4,133,936
392	4,133,937
447	4,133,938
	4,133,939

CLASS 429

12	4,133,940
33	4,133,941

CLASS 431

4	4,133,628
12	4,133,629
328	4,133,632
352	4,133,633
359	4,133,630
	4,133,631

CLASS 432

2	4,133,634
19	4,133,635
72	4,133,636

CLASS 521

147	4,133,942
154	4,133,781
163	4,133,943
167	4,133,780

CLASS 526

65	4,133,944
189	4,133,945
282	4,133,946

CLASS 528

75 R	4,133,801
340	4,133,803
502	4,133,802
	4,133,947

CLASS 536

1	4,133,948
7	4,133,949
9	4,133,950
25	4,133,951
121	4,133,952

CLASS 542

454	4,133,953

CLASS 544

101	4,133,954
183	4,133,955
336	4,133,956
357	4,133,957

CLASS 546

96	4,133,812

CLASS 548

321	4,133,958

CLASS 560

53	4,133,959
171	4,133,960
190	4,133,961
245	4,133,962

CLASS 562

503	4,133,829
519	4,133,963
571	4,133,964

CLASS 568

558	4,133,835
596	4,133,836
723	4,133,965
902	4,133,966

CLASSIFICATION OF DESIGNS

D2—	24	250,736
	226	250,737
	293	250,738
	373	250,739
D6—	67	250,740
		250,741
	113	250,742
	177	250,743
D7—	193	250,744
D8—	8	250,745
	358	250,746
D9—	175	250,747
	235	250,748
D10—	39	250,749
		250,750
		250,751
		250,752
	60	250,753
	65	250,754
	77	250,755
	93	250,756
D11—	81	250,757
	160	250,758
D14—	6	250,759
	34	250,760
	69	250,761
	73	250,762
		250,763
D15—	28	250,764
D16—	32	250,765
	42	250,766
D19—	51	250,767
D20—	8	250,789
	9	250,790
D23—	7	250,768
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